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JANUARY 1916

THE CLAY-WORKER

OFFICIAL ORGAN OF N.B.M.A.

HOTEL STATLER
HEADQUARTERS

30th CONVENTION
FEB. 20-26, 1916

HOTEL STATLER, CLEVELAND
1000 ROOMS 1000 BATHS

PUBLISHED MONTHLY BY
T. A. RANDALL & CO.
INDIANAPOLIS, IND.

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BUYERS' READY REFERENCE LIST
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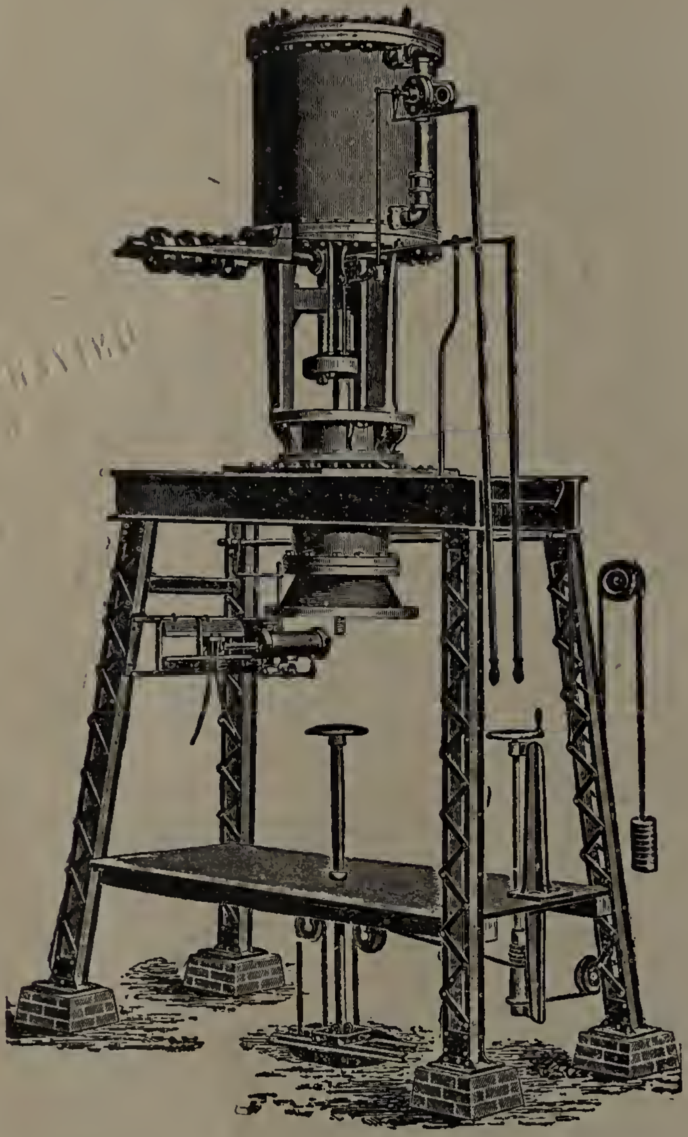
All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.

ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC. Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.



We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

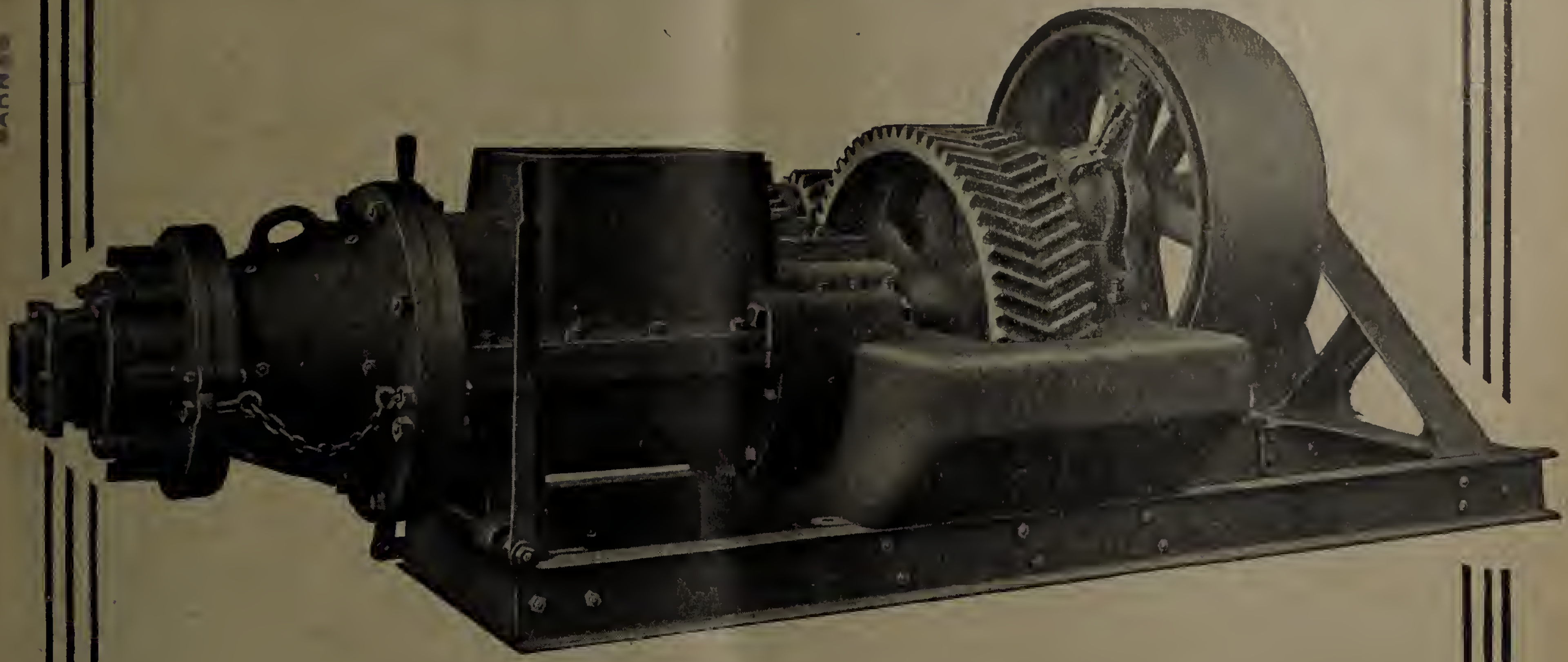
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



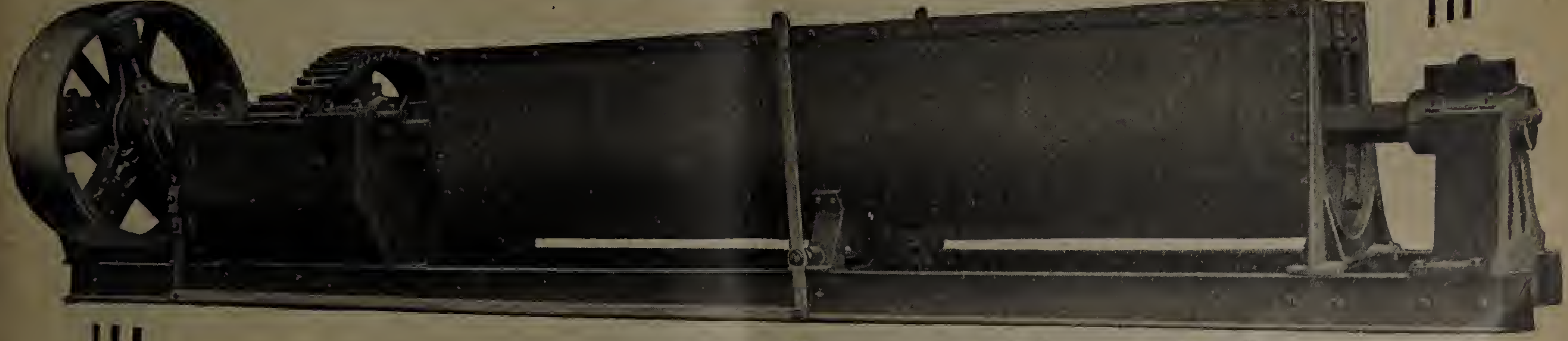
THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.



THE BONNOT COMPANY

CANTON, OHIO

909 N. Y. Life Bldg.
KANSAS CITY, MO.

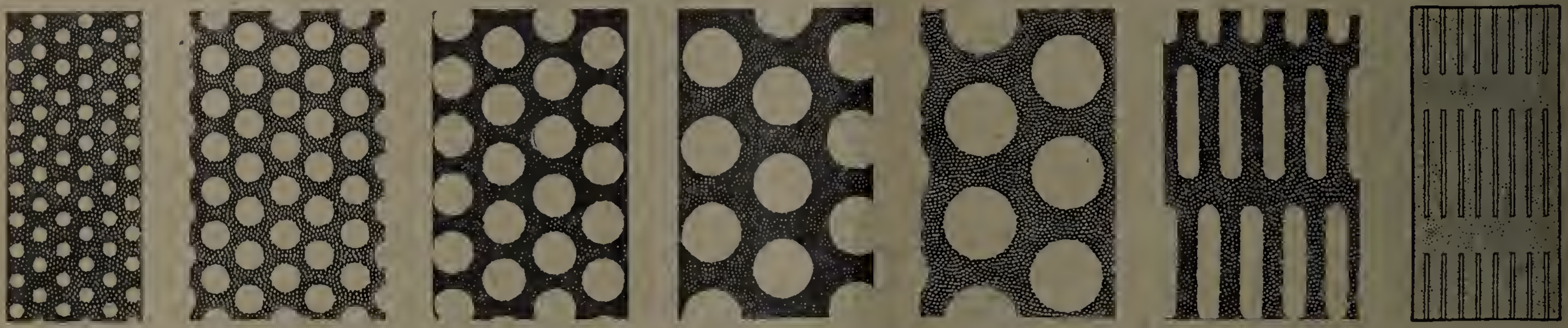
211 Higgins Bldg.
LOS ANGELES, CAL.

361225

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

In Foul Weather or Fair the Mathews

**Gravity Brick Conveyer
Is always on the job**

It never tires—never shirks—never complains—never goes on strikes—never lays off—always on hand after pay day. It has no likes nor dislikes—will handle rough common brick or smooth face brick—large building units or round drain tile—heavy paving brick or hollow blocks—anything that will run on ball-bearing rollers.

Main Office and
Factory:
ELLWOOD CITY, PA.

SPEED - MATHEWS GRAVITY CARRIER COMPANY - The Mathews Way - The Saving Way - ECONOMY

Branch Factories:
TORONTO, ONT.
LONDON, ENG.

RODGERS FOR DRYERS RODGERS RODGERS FOR DRYERS

YOU CANNOT EXPECT TO CONTINUE TO GET

the BEST results obtainable at your plant, in the way of PRODUCT and PROFIT,

UNLESS YOU GIVE,

now and then, of your time and profit to its improvement.

Out of date methods and machinery LOSE more money, every year, for "behind the times" manufacturers, than their continued use will ever MAKE for them.

Take a CRITICAL LOOK at your plant—the kind of a look you take when visiting a competitor's plant—and see how it would look to an "OUTSIDER".

If such a look results in dissatisfaction on your part, and the realization of needed DRYER Improvements—or the reconstruction of part of, or your entire plant—take the first step toward GETTING what you may desire by GIVING an outline of your requirements to the

L. E. RODGERS ENGINEERING CO.

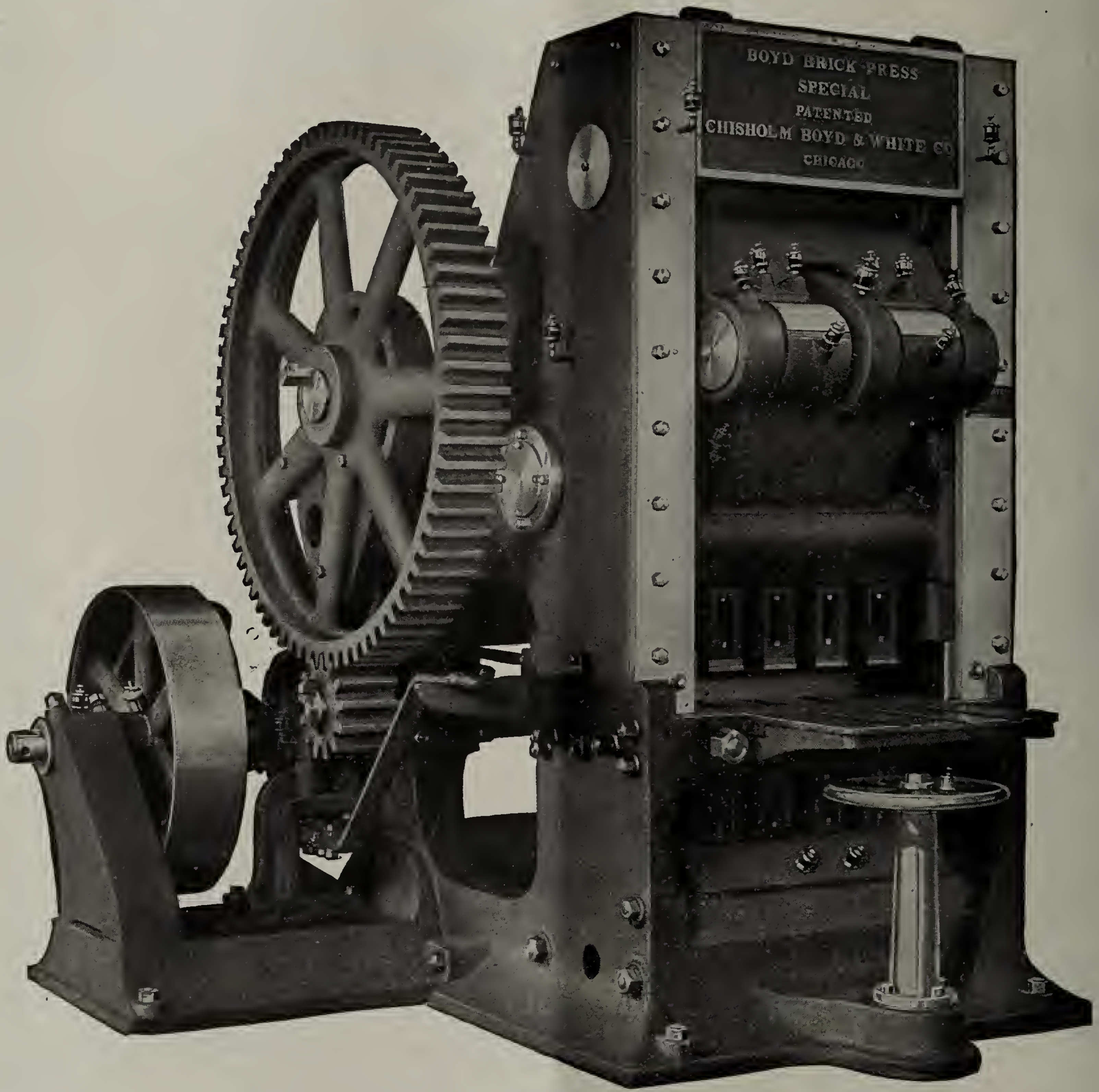
Waste Heat Dryer Specialists
Brick Works Engineers
Largest Manufacturers of Brick Drying Equipment in the United States
General Offices and Works

O
H ZANESVILLE, I
O

RODGERS FOR DRYERS RODGERS RODGERS FOR DRYERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Buyers Ready Reference List.

To Find Any Particular Firm or Advertisement See "Index to Ads" as Cited on Front Cover Page.

Ammeters.
The Brown Instrument Co.

Analysists and Chemists.
Ceramic Supply & Con. Co.
N. J. State University.
Richardson-Lovejoy Engr. Co.

Arch Cutting Apparatus.
Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.
Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.
(See Cutting Tables.)

Barrows and Trucks.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
H. Brewer & Co.
Carnell, Geo.
Chambers Bros. Co.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.
Roessler-Hasslacher Chem. Co.

Bearings, Roller.
(See Supplies.)

Belting.
Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.
American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Blowers.
American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.
American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.

Brick (Building).
Illinois Brick Co.
Hydraulic-Press Brick Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).
Chicago Retort & Fire Brick Co.
Parker-Russell M. & M. Co.

Brick (Paving).
Alton Brick Co.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
Mayer Brick Co., C. P.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.
American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.
American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Mchy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Fernholtz Brick Machy. Co.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Soft Mud).
American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Martin Brick Mch. Mfg. Co., H.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).
American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers-Equipment Co.
Reagan, Daniel E.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Dry Press).
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
Fernholtz Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.
International Clay Mach. Co.

Brick Setting Machinery.
American Clay Machinery Co.

Buffing Machinery.
American Clay Machinery Co.

Burning and Drying Systems.
American Clay Machinery Co.
American Blower Co.
Boss, John C.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.
(See Dryer and Dumping Cars.)

Carbide Coating.
Stowell, E. R.

Castings.
American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.
Koch, J. J.
Richardson-Lovejoy Engr. Co.
Schaffer Eng. & Equip. Co.

Clay Crushers and Pulverizers.
American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Phillips & McLaren Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clays.
American Clay Machinery Co.

Clay Dryers.
American Process Co.
Schaffer Eng. & Equip. Co.

Clay Feeders and Mixers.
American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.
(See Scrapers.)

Clay Steamers.
American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.
American Clay Machinery Co.
Fate Co., The J. D.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.
(See Supplies.)

Coloring Materials.
Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.
Orton, Edward, Jr.

Conveying Machinery.
American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.
American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.
Ceramic Supply & Con. Co.
Koch, J. J.
Richardson-Lovejoy Engr. Co.
Schaffer Eng. & Equip. Co.

Couplings.
(See Supplies.)

Cutting Tables (Brick & Tile).
American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.
American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.
(See Supplies.)

Dies.
(See Supplies.)

Disintegrators.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.
Ceramic Supply & Con. Co.

Drain Tile Machinery.
(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.
(See Supplies.)

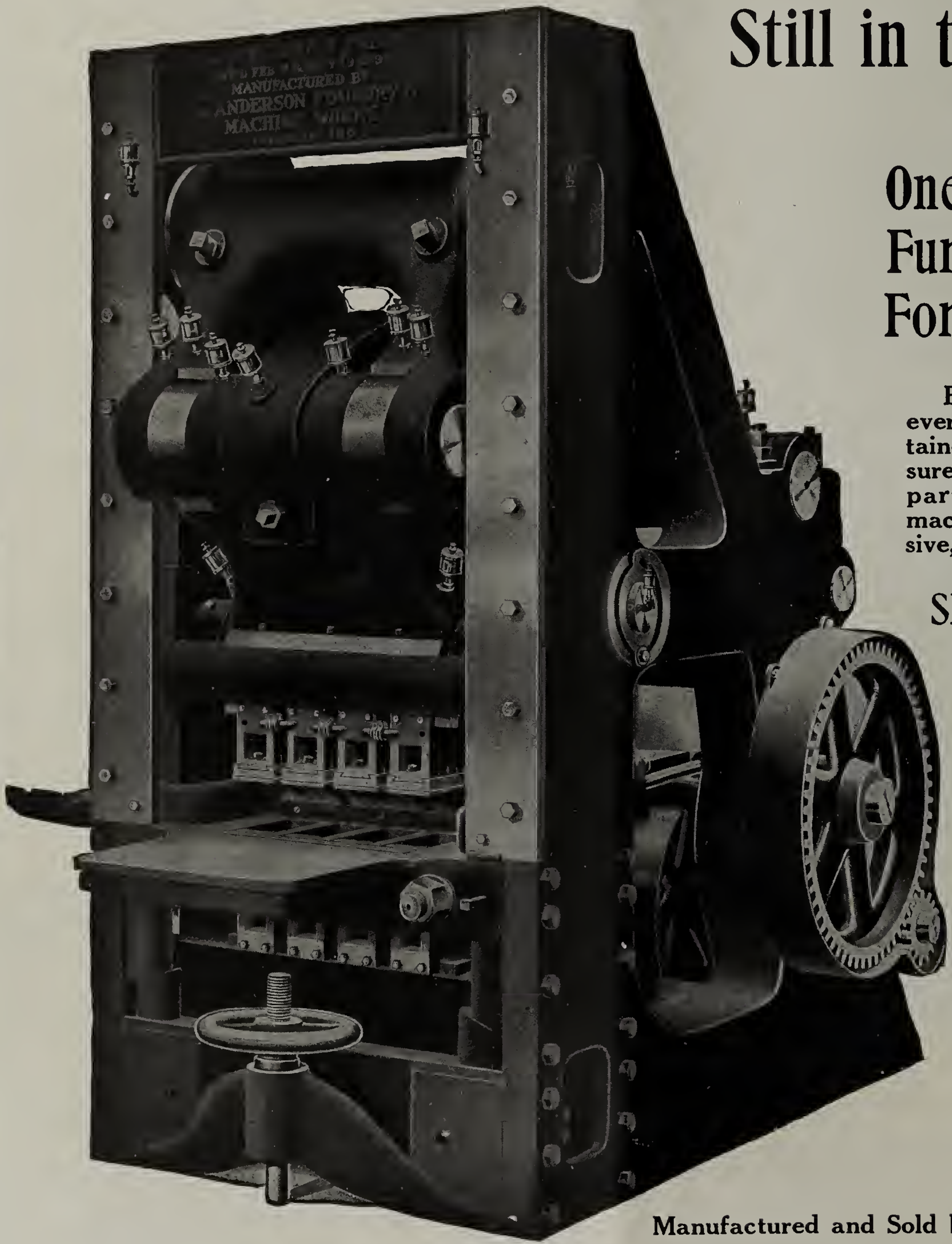
Dryers.
American Clay Machinery Co.
American Process Co.
Boss Co., John C.
Chambers Bros. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Richardson-Lovejoy Engr. Co.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

Dryer Cars.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.

(Continued on page 9.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

Sold by the C. W. RAYMOND CO.
Dayton, Ohio

ANDERSON, IND.

Buyers Ready Reference List—Continued.

Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.
Wellington Machine Co.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Brown Instrument Co., The
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

Elevating Equipment.

(See Conveyors.)

Engines.

American Clay Machinery Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Rodgers Engr. Co., The L. E.
Schaffer Eng. & Equip. Co.
Trautwein Dryer & Engr. Co.

Fans.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

Filter Presses.

American Clay Machinery Co.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Fire Brick and Fire Clay.

Parker-Russell M. & M. Co.

Floor Tile.

Chicago Ret. & Fire Brick Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

Brown Instrument Co., The
International Clay Mach. Co.
Richardson-Lovejoy Engr. Co.

Gas Fire Continuous Kilns.

Raymond Co., The C. W.

Gears.

(See Supplies.)

Granulators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Grates.

American Clay Machinery Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.

Gravity Carriers.

Mathews Gravity Carrier Co.
Taplin-Rice-Cerkin Co.

Gravity Haulage.

American Clay Machinery Co.

Grouter.

Marsh-Capron Mfg. Co.

Hand-Power Presses.

American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Stevenson & Co.

Hand Winch.

(See Supplies.)

Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Illustrators.

Lamb, J. & R.

Insurance.

Mantel, Tile and Grate Monthly.

Jacks.

(See Supplies.)

(Continued on page 11.)

MUELLER'S NEW AUGER BRICK MACHINERY

Auger Brick Machines of most advanced design, in capacity from 8,000 to 60,000 per day.

Horsepower Brick Machines, Hand Plunger Presses for drain tiles, hollow blocks, etc.

Smooth Roll Crushers, with two and three rolls, Break-roll Crushers for hard shale.

Pug Mills, single or double shaft, for any capacity, Automatic Feeders.

Automatic Brick, Block and Drain Tile Cutters.

Hand tables for all kinds of clay products, designers of special tables.

Complete equipment for making lockplate building blocks, coupling building blocks and other hollow wares.

ROOFING TILE MACHINERY

Revolving Presses, Trimming Presses, Hand Roofing-Tile Presses, molds in plaster or metal.
Special Double Shaft Auger Machines for roofing tiles, and mechanically lubricated dies.
Cutting tables for shingles, promenades, interlocking, Spanish tiles etc.

MUELLER BROS.

1436 Macklind Ave. (on Frisco Tracks) **ST. LOUIS, MO.**

TWENTY-SEVEN independent, competing companies, operating 41 plants, are making Wire-Cut Lug paving brick under license contract, with the Dunn Wire-Cut Lug Brick Co., of Conneaut, O.

Fifty times as many brick sold in 1915 as in 1910.

These brick now in general use in 20 states and the Dominion of Canada; are specified exclusively by several large cities and are preferred by several state highway departments.

Licensees get the benefit of free services of R. T. Stull, an expert ceramic engineer, in overcoming troubles at the plant.

The Dunn Company protects the interests of licensees by maintaining a corps of expert highway engineers to give free advisory services to cities, counties and state authorities in constructional work.

The Dunn Company maintains a publicity department, which conducts national advertising campaigns and special individual correspondence for promoting the paving brick industry.

The Dunn Company has done more than any other one agency to popularize brick for pavements, to protect the paving brick industry and reputable manufacturers.

Only reputable companies which have proved that they can make first-class brick are licensed.

LICENSED MANUFACTURERS

- Corry Brick & Tile Co., Corry, Pa.
- United Brick Co., Greensburg, Pa.
  - Plant at Conneaut, Ohio.
- Sterling Brick Co., Olean, N. Y.
- Reynoldsville Brick & Tile Co., Reynoldsville, Pa.
- Danville Brick Co., Danville, Ill.
- Clinton Paving Brick Co., Clinton, Ind.
- Alton Brick Co., Alton, Ill.
- Deckman-Duty Brick Co., Cleveland, O.
  - Plants at Cleveland, Carrollton and Malvern, Ohio.
- Tuna Valley Pressed Brick Co., Bradford, Pa.
- Metropolitan Paving Brick Co., Canton, Ohio.
  - Four Plants at Canton, O., and One at Willow, O.
- Bessemer Limestone Co., Youngstown, O.
  - Three Plants at Bessemer, Pa.
- Peebles Paving Brick Co., Portsmouth, O.
  - Two Plants at Portsmouth, O., and One at Firebrick, Ky.
- Murphysboro Paving Brick Co., Murphysboro, Ill.
- Southern Clay Manufacturing Co., Chattanooga, Tenn.
  - Plants at Robbins, Tenn., and Coaldale, Ala.
- McAvoy Vitrified Brick Co., Philadelphia, Pa.
  - Plant at Perkiomen Junction, Pa.
- Windsor Brick Co., Akron, Ohio.
- Hocking Valley Brick Co., Columbus, O.
  - Plant at Logan, Ohio.
- Veedersburg Paver Co., Veedersburg, Ind.
- Springfield Paving Brick Co., Springfield, Ill.
- Terre Haute Vitrified Brick Co., Terre Haute, Ind.
- Albion Vitrified Brick Co., Albion, Ill.
- Alliance Clay Product Co., Alliance, O.
- Westport Paving Brick Co., Baltimore, Md.
- Mack Manufacturing Co., New Cumberland, W. Va.
  - Four Plants at New Cumberland, W. Va.
- Hydraulic-Press Brick Co.. St. Louis, Mo.
- Barr Clay Co., Streator, Ill.
- Burton-Townsend Co., Zanesville, Ohio.

The Dunn Wire=Cut=Lug Brick Company

(Licensors)

Conneaut, Ohio

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Boss Co., John C.
Hook Patent Kiln Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Richardson-Lovejoy Engr. Co.
Schaffer Eng. Equip. Co.
Smith Co., Claude.
Swift, Edward A.
Yates, Alfred

Kilns, Doors, Castings and Frames

(See Supplies.)

Kiln Bands.

Holliday, W. J., & Co.

Kiln Floor Tile.

Chicago Ret. & Fire Brick Co.

Knives.

(See Supplies.)

Locomotives.

Davenport Locomotive Works.
Dewey Bros.
Fate Co., The J. D.

Manganese.

(See Coloring Materials.)

Mechanical Draft.

American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

Mineral Paint.

(See Coloring Materials.)

Molds (Brick).

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Wallace Mfg. Co.

Mortar Colors.

(See Coloring Materials.)

Motor Trucks.

Fate Co., The J. D.

Oil Burners.

Schurs Oil Burner Co.

Paints.

(See Coloring Materials.)

Pallets.

Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).

(See Dry and Wet Pans.)

Paving Brick or Block.

(See Brick.)

Perforated Sheet Metal.

Caldwell & Sons, H. W.
Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

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Barrett Mfg. Co.

Plows.

(See Scrapers.)

Poidometers.

Schaffer Eng. & Equip. Co.

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American Clay Machinery Co.
Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.

Pottery Machinery.

American Clay Machinery Co.
Baird Machinery & Mfg. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

Power Plant Equipment.

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Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Presses.

(See Brick Machines, also Sewer Pipe Machinery, also Roofing Tile Machinery.)

Pug Mills.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
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Pulleys.

(See Supplies.)

Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Fate Co., The J. D.
Taplin-Rice-Clerkin Co.

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Ceramic Supply & Con. Co.
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Hetherington & Berner.
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Brown Instrument Co.
Ceramic Supply & Con. Co.
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Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
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Revolution Indicators.

Brown Instrument Co.
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(Continued on page 12.)

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(See Supplies.)

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Fate Co., The J. D.
Hensley, J. W.
International Clay Mach. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.

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Ceramic Supply & Con. Co.

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Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Fernholtz Brick Machinery Co.
Lakewood Engineering Co.
Raymond Co., The C. W.

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New Jersey State School.
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Ohio State University.

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Arbuckle & Co.
Lechtenberg Brothers.
Eagle Iron Works.

Screens.

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Brewer & Co., H.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Harrington & King Perf. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Taplin-Rice-Clerkin Co.

Sewer Pipe Machinery.

American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Taplin-Rice-Clerkin Co.

Steam Gauges.

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Steam Shovels.

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Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.

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Anderson Fdy. & Mach. Works.
Atlas Car & Mfg. Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
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Eastern Brick Machinery Co.
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Freese & Co., E. M.
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Martin Brick Mach. Mfg. Co., H.
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Wallace Mfg. Co.

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American Clay Machinery Co.
Atlas Car & Mfg. Co.
Lakewood Engineering Co.

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Carnell, Geo.
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Ceramic Supply & Engr. Co.
Rodgers Engr. Co., The L. E.
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American Clay Machinery Co.
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Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
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(See Rails.)

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(See Supplies.)

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Voltmeters.

Brown Instrument Co.

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(See Supplies.)

Wheelbarrows.

(See Barrows.)

Wet Pans.

(See Pans.)

Wire.

(See Cutting Wire.)

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STEAM SHOVELS

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Send at once Circular 22B containing material and facts about the Thew Shovel of interest to all clayworkers, as advertised in The Clay-Worker.

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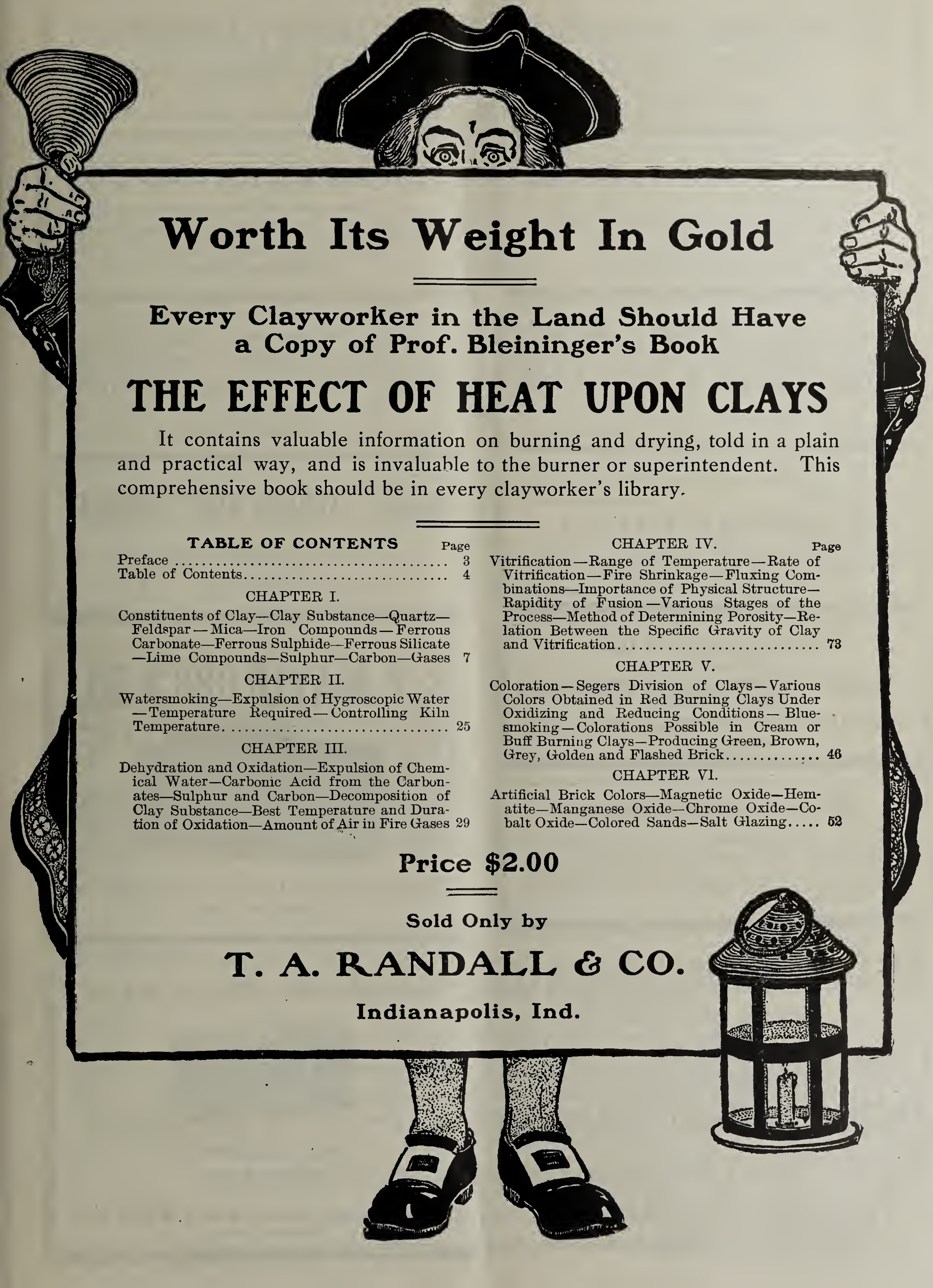

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THE EFFECT OF HEAT UPON CLAYS

It contains valuable information on burning and drying, told in a plain and practical way, and is invaluable to the burner or superintendent. This comprehensive book should be in every clayworker's library.

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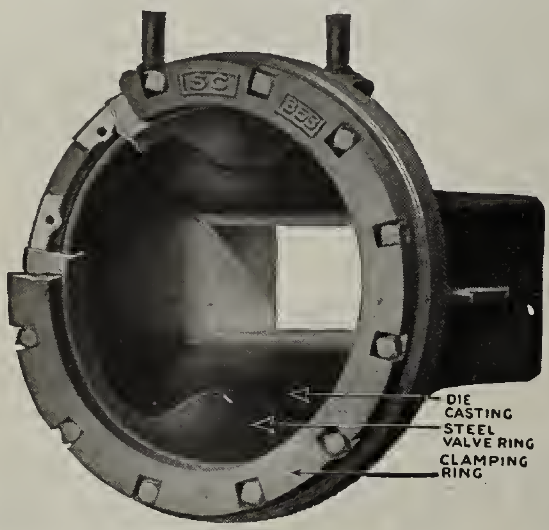

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The Chambers Lubricating Die Helps on the Rattler Test.

The lubricant is applied at the point of greatest resistance and is forced into the die under pressure. Contributes to a more uniform movement of clay bar. Gritty shales and fire clays possessing but little plasticity are molded more successfully with this die. Less power, less waste, better product. Used on various auger machines. Both side-cut and end-cut.

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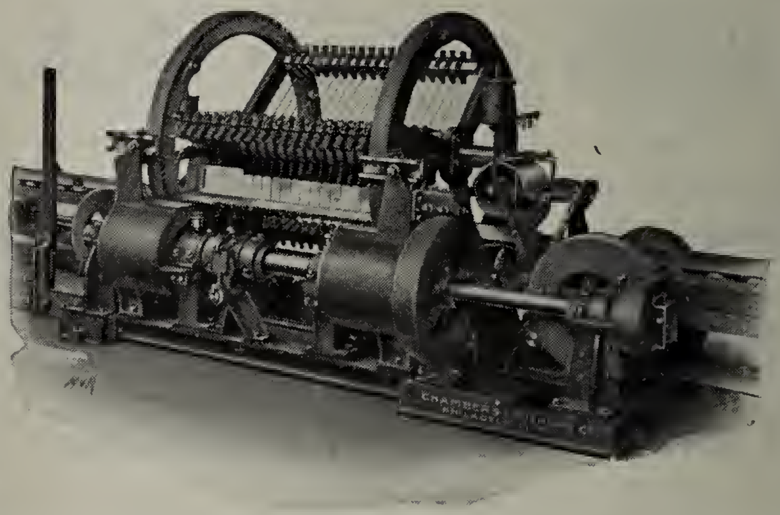

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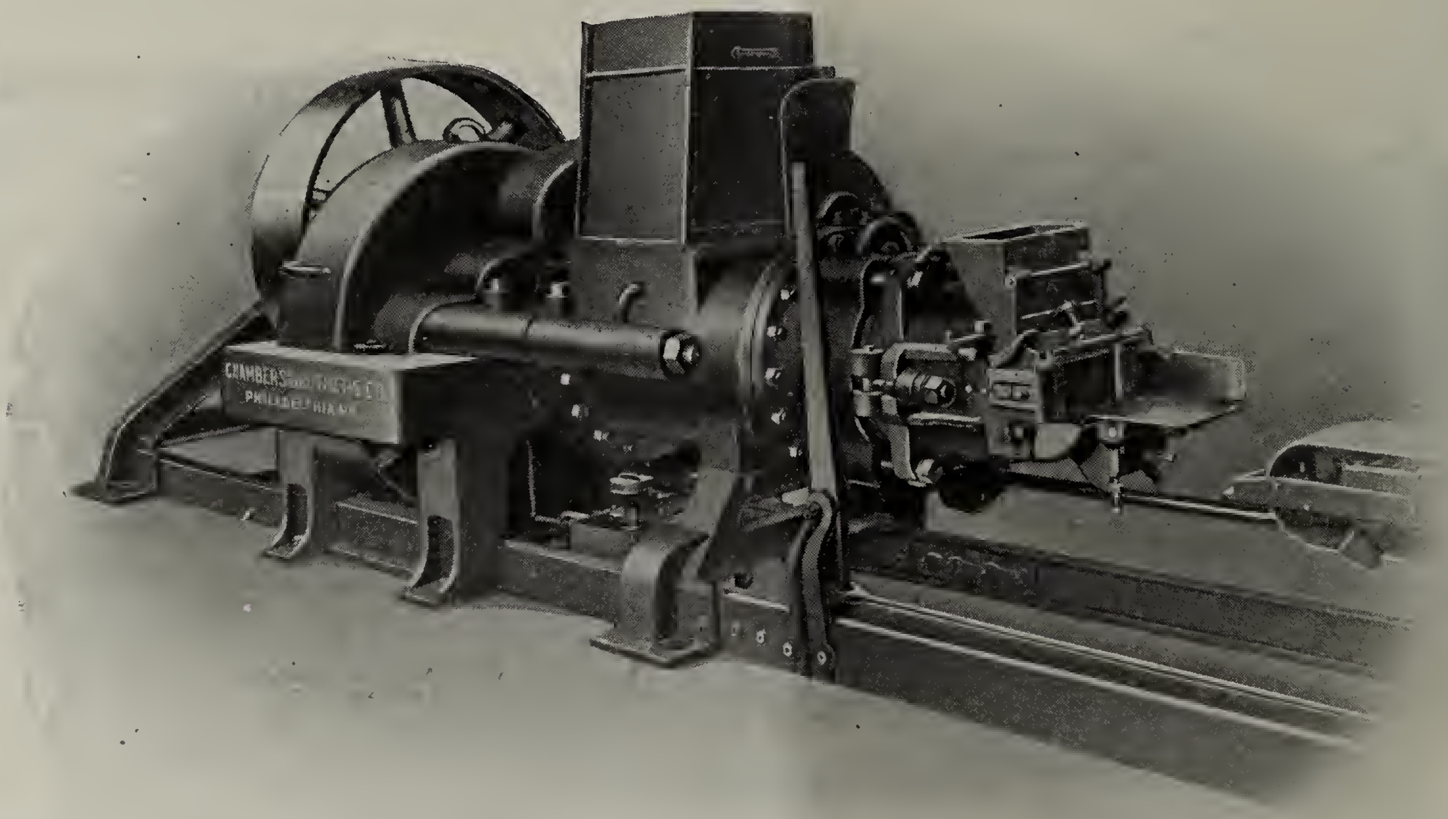

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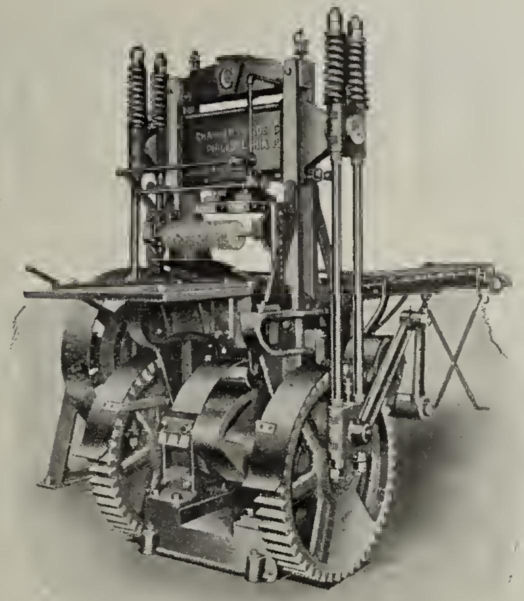

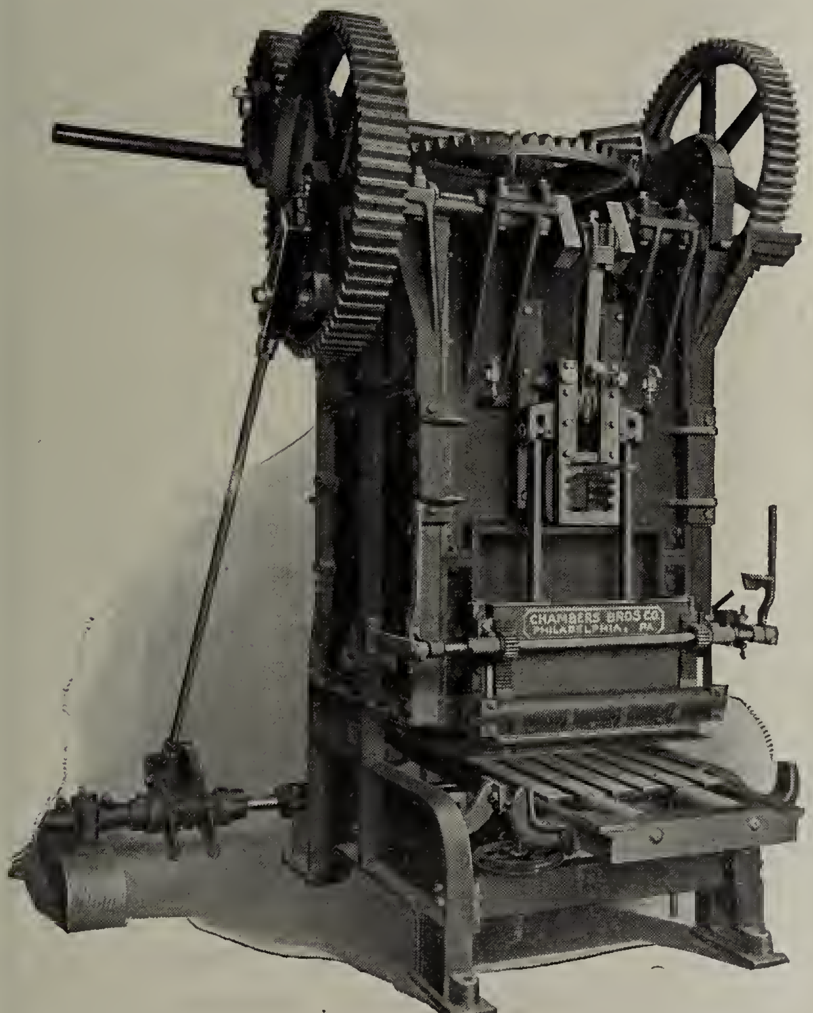

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FOR BUILDING BRICK---FOR FIRE BRICK

A substantial machine constructed of iron and steel and designed along well established lines for machinery of this class.

Improved relief mechanism for mold pusher, located at rear of machine away from interference with operatives and from waste material.

Machine built for either right or left feeding.

Access to inside of main chamber through opening, 33 x 24 inches, covered by one piece of boiler plate, conveniently removable.

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One piece crank shaft of forged steel. Three journal bearings on crank shaft.

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Molds sharp clean edge brick as stiff as can be dumped from the molds.

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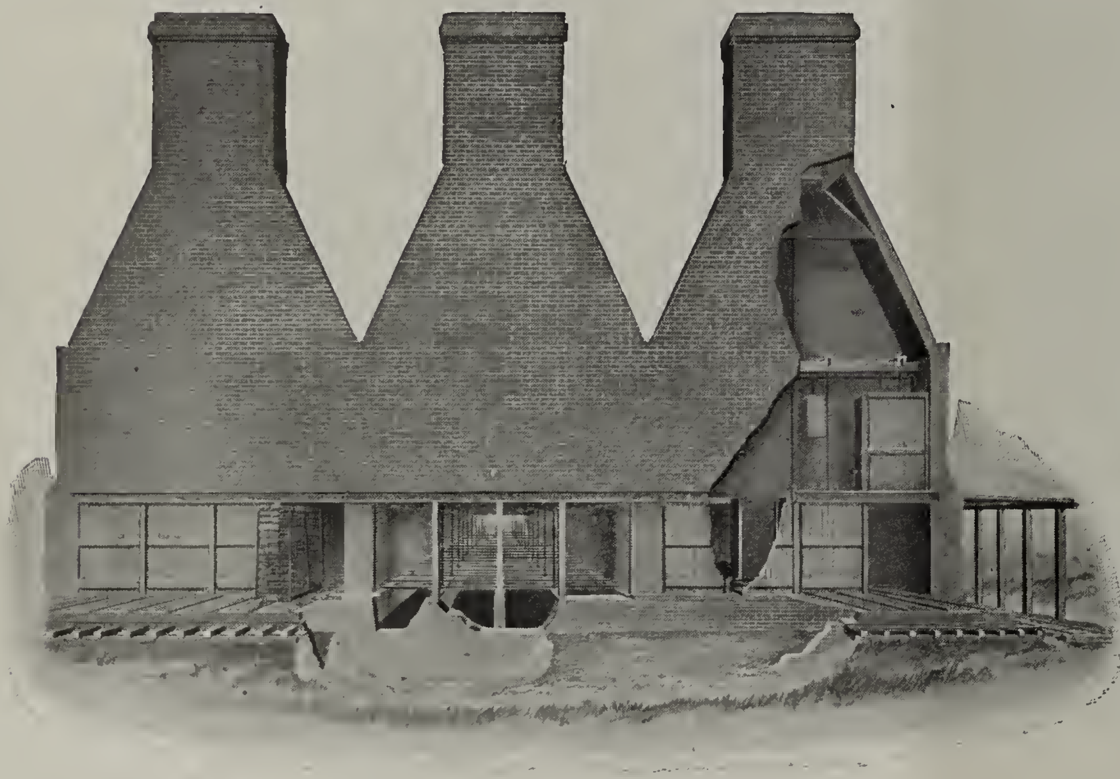
Put your drying problems up to him. Find out what The Standard Natural Draft Steam Drying System is doing for brother brickmakers---and what we will *guarantee* it to do at *your* plant.



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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

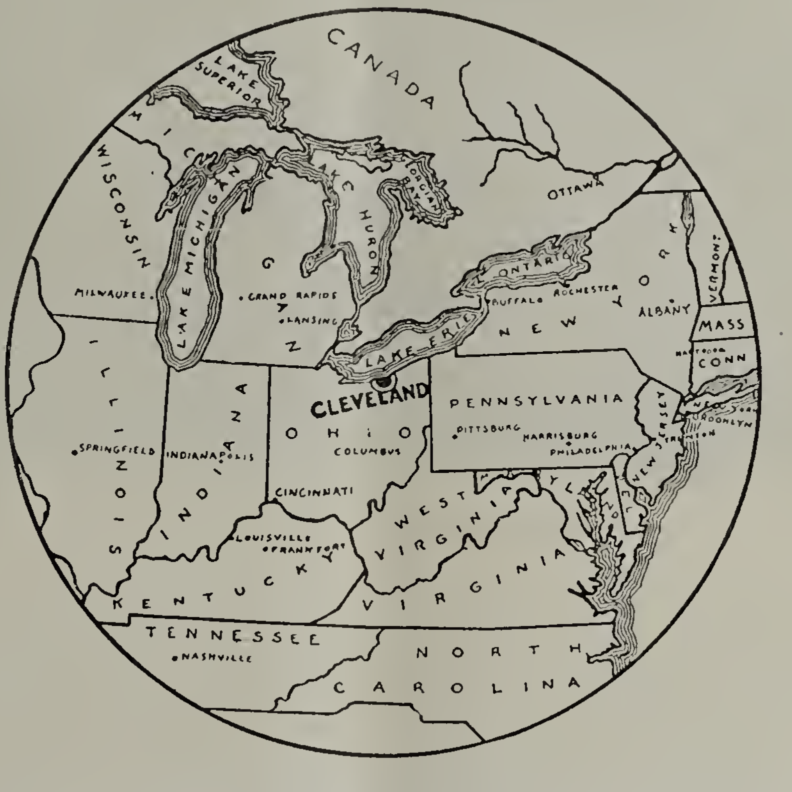
Vol. LXV. INDIANAPOLIS, IND., JANUARY, 1916. No. 1

Written for The Clay-Worker.

THE CONVENTION CITY.

Some of the Many Points of Interest in and About the Ohio Metropolis That Make It Especially Attractive to Clayworkers.

CLEVELAND, the sixth city in the United States in rank of population, but first in rank in certain municipal affairs and improvements, was selected as the convention city for the thirtieth annual meeting of the National Brick Manufacturers' Association and the auxiliary bodies.



Why the Coming Convention Should Be the Largest in the History of the N. B. M. A.

It was a wise choice, which fact will be proven by a large attendance and a busy week (February 21-26), replete with pleasure-giving functions and interesting associational meetings, wherein many questions of vital importance to the craft will be thoroughly discussed and definitely considered.

The selection of Cleveland was made by the executive committee after careful consideration. A number of other cities petitioned for the convention, including Atlantic City, St. Louis, Pittsburg, Dayton, Cincinnati, Richmond, Va., Baltimore and New York; all sent urgent invitations, so that it required much time and study before the final decision was made.

Cleveland was favored for several good reasons. First of all, the Complete Building Show is to be held there February 16-26. This show promises to be the greatest of its kind ever held in this country, with a complete house to be given away, seven monster community exhibits, an architectural competition, and more than two hundred individual exhibits of materials and equipment for all kinds of buildings. This show will be of vital importance to the clay industries of Cleveland and vicinity, for while other materials will be exhibited, clay products will be much in evidence and render no little publicity to the real facts concerning their beauty, strength and adaptability. It was the desire of assisting in this good work, of throwing the strength of the National Association back of this important enterprise, that was foremost in the minds of the executive committee when the decision was made.

Other minor points were kept well in mind, chief of which was the fact that Cleveland is in the heart of the clayworking industry of this country, with 50 per cent. of the population of the United States and Canada living within a radius of 500 miles from Ohio's chief metropolis.

Radiating railroads connect almost every town and hamlet within this radius, with only a night's journey from any point within the circle to Cleveland (see map). This affords the majority of the clayworkers in the United States and Canada a splendid opportunity of reaching the convention city without loss of time or the large expenditure of money for traveling expenses.

Cleveland is an important clay products center, there being seventeen ceramic plants within its confines. It is the home city of our amiable first vice president, Mr. Charles Deckman, who will be elected president this year, if the well-established rule of raising the vice presidents in turn to the higher offices is adhered to as heretofore. Many other prominent lights in the ceramic industry also make Cleveland their home city.

Cleveland is the headquarters of the National Paving Brick Manufacturers' Association, the Hollow Building Tile Manufacturers' Association, and the Society Advocating Fire Elimination. Cleveland is located in Cuyahoga county, which possesses nearly six hundred miles of splendid brick paved country highways. It leads the world in this best type of highway construction. All the main arteries leading out of Cleveland are paved with brick, serving the farmers in the best manner possible in marketing their products and affording the autoist and tourist ease of travel.

While Cleveland is not strictly a brick built city, it is becoming more and more so by rapid bounds as the years pass by. Cleveland possesses many thousands of splendid brick-built homes and structures of modern architectural design.

Cleveland is one of the principal manufacturing centers in the United States, and its continued rapid growth has made necessary the building of a great number of manufacturing establishments and residences yearly. These structures are, for the most part, made of clay products supplied principally by the local concerns, including the several independent clayworking concerns and such supply firms as the Cleveland Brick Sales Company, 907 Schofield Building; Cleveland Builders' Supply Company, tenth floor Leader-News Building; Euclid Builders' Supply Company, 4716 Leader-News Building; Lake Erie Builders' Supply Company, 1220 East Fifty-fifth street; Ohio Coal and Supply Company, 814 Columbia Building; Cuyahoga Builders' Supply Company, Thirteenth floor Schofield Building, and Queisser-Bliss Company, 1237 Schofield Building. There are many beautiful brick exhibits in the offices of these supply firms, well worth seeing.

Cleveland is the home of many clayworking machinery and supply companies. Located there are the factories of the Lakewood Engineering Company, the Atlas Car and Manufacturing Company, the Sawyer Belting Company, the Cleveland Alloys Company, the Beighlee Electric Company, the Price Electric Company and the C. O. Bartlett & Snow Company. Within a short distance of Cleveland are the factories of the Thew Steam Shovel Company, Lorain; the J. D. Fate Company, Plymouth; the Bonnot Company, Canton; the Wellington Company, Wellington; Taplin-Rice-Clerkin Company, Akron; the American Clay Machinery Company, Bucyrus and Willoughby; the E. M. Freese & Co., Galion; Rodgers Engineering Co., Zanesville, Ohio; Hook Patent Kiln Co., Vigo; Ceramic Supply and Construction Co., Richardson & Lovejoy Engineering Co. and Chase Foundry and Machine Co., Columbus; Stevenson Co., Wellsville; International Brick Machinery Co. and Manufacturers Equipment Co., Dayton; Ohio Galvanizing Co., Niles, and Schaffer Engineering Co., Tiffin. Any or all of these firms may be reached conveniently and quickly from Cleveland.

University Circle—Western Reserve University and Case School of Applied Science Buildings in the Background.

Cleveland has a number of important features other than those directly connected with the clayworking industry. Cleveland has been called the best governed city in America for many years. The municipal administration of Cleveland has been remarkably free from graft. This is indicated by the astonishing material growth. The population has increased 42 per cent. since 1904. In 1914 the population was 650,110. The area of Cleveland (52.53 miles) has increased 41 per cent. in the last ten years. The assessed valuation of real property has increased 329 per cent., and the number of manufacturing plants has increased 59 per cent., the number of plants being 2,148. The building construction increased 78 per cent. These are a few facts that show the healthy civic development.

Cleveland can rightly boast of its high-class municipal service. The streets are broad and clean, the city collecting and disposing of the garbage and rubbish free of charge. The fire department is equipped for every emergency; so thorough has been its work that Cleveland holds the record for the lowest per capita fire loss of all American cities of 300,000 or more in 1911.

The police force is known throughout the country for its efficiency, and the departments of charity, correction and sanitation have been complimented throughout the land.

The committees on municipal sanitation, housing conditions and other committees have been most effective in promoting the astonishing progress in their lines.

The Cleveland municipal courts, with seven judges, have established a precedent in the hastening of the adjudication of cases and the elimination of the many evils of minor litigation in the lower courts and police courts.

Cleveland is known far and wide as the city of 3-cent car fare, with exceptionally good service and universal transfers without extra charge.

The Cleveland public school system is among the best in this country. There are two technical high schools, two commercial high schools, the Case School of Applied Science, the Reserve University, St. Ignatius College, and an extensive parochial school system.

There are many public libraries and branch libraries scattered throughout the city.

The water rates are lower than the minimum rates of any of the other large cities, with only two exceptions. The water supply is secured from a point four miles out in Lake Erie, pumped through a 9-foot tunnel underneath the bottom of the lake.

Cleveland is a city of parks and boulevards and amusement places. There are forty miles of beautiful boulevards encircling the entire city, which extends twenty miles along Lake Erie. There are 2,000 acres of inland lakes and ponds. There are twelve public parks, three of which are located on the shores of Lake Erie.

The free public playgrounds for recreation and amusements are many and varied. The one greatest convenience to the visitors is the unusually high-class, good restaurant service found in Cleveland. The hotel service in Cleveland is splendid. The Hotel Statler, the leading hostelry, is noted far and near for its low rates and its excellent equipment and attention.

Scene in Rockefeller Park, Cleveland, Ohio.

DETAILS OF A GERMAN POTTERY KILN.

In connection with a report on the use of continuous kilns for burning pottery in Germany Consul Harry G. Seltzer, of Breslau, has forwarded a twenty-eight-page monograph on the introduction of tunnel ovens in the pottery industry, which gives further information on the subject. The monograph was written by Dr. Carl Loesser, and is based on the actual experience of T. Tielsch & Co., of Altwasser, in Schlesien. This pamphlet is printed in German and will be loaned by the Bureau of Foreign and Domestic Commerce, at Washington, to any one interested in the matter enough to request it.

CLEVELAND A GREAT PRODUCER OF CLAY PRODUCTS.

CLEVELAND, the sixth city in population in the United States, ranks high as a clay product manufacturing center. Within the boundaries of this great city are located seventeen clay product manufactories, producing great quantities of common brick, hollow brick, face brick, paving brick and block, hollow tile, floor tile and a small amount of pottery. Paving brick are made on the plants of the Metropolitan Brick Company, the Medal Paving Brick Company, the Cleveland Brick and Clay Company and the Newburg Brick and Clay Company. There are three plants manufacturing face brick, namely, those of the Hydraulic Pressed Brick Company, the Cuyahoga Brick and Shale Company and the Murray Brick Company. Seven factories manufacture common brick, three of which are owned and operated by the Farr Brick Company. The others are those of the Barkwill Brick Company, the American Building Brick Company, the Cullen Brick Company and the Standard Brick Company. Five plants turn out large quantities of hollow tile—the Barkwill Brick Company, Ohio Clay Company, Cuyahoga Brick and Shale Company and the Camp Conduit Company (two). The Cowan Potteries, a new concern in Cleveland, manufactures a high-grade floor tile and a small amount of pottery.

The largest producer of brick in Cleveland is the Farr Brick Company, with its three large plants.

The Farr Brick Company.

This firm astonished the world a year or so ago by erecting in Cleveland a $10,000 permanent display, emphasizing the slogan, "Build with Brick," and giving the prospective builders of Cleveland an ocular demonstration of the beauty and stability of common brick. This was a surprisingly large am for a common brick manufacturer to spend on a pub-city campaign, but the results proved the wisdom of such an expenditure. "BUY FARR THE BEST" is a slogan known to all in Cleveland, and so great have grown the sales of this company that it has been necessary to buy additional trucks and to have a night as well as a day delivery of their product. Their publicity campaign is still continuing, and scarcely a week passes but that some clever advertisement boosting their product appears in the Cleveland papers. Mr. Robert Mitchell has served the company well in his capacity as their publicity and sales manager.

The history of this company is interesting. Warren Farr, the father of the present owners, was a sewer contractor of Cleveland in 1889. During that year there was a shortage of brick, and it was impossible for him to get the brick necessary to fill his contracts. Not wishing to lose a large sum of money as a penalty for not completing his work according to schedule, he took the only way possible out of it and manufactured brick himself for the purpose.

He bought out the Benmore brick plant, located in the Cuyahoga river valley, where the Corrigan & McKinney steel plant is now situated. The plant was just a horse-sweep hand yard. The brick were dried in the open.

He made the brick to fill his contract and was so impressed with the possibilities in brickmaking that in 1890 he built the original Farr plant of the Farr Brick Company as a 30,000 unit, with a Penfield upright machine. The first year he dried the brick in the open yard, but the second he changed to the open rack system.

About two or three years later he put in a Buffalo Forge Company's car drier. The plant was run along on this basis until 1902, when another machine was added and a Martin drier was installed.

Mr. Farr died in 1901 and the business was turned over to the children, a daughter handling the bookkeeping until the time she was married.

The two sons, Herbert J. and Ernest W. Farr, have managed the affairs of the company from that time to the present date.

In 1904 another machine was added and a second Martin pipe rack drier. That was the condition of the plant when it burned down May 26, 1911. At that time it was producing 100,000 daily. They had purchased the G plant March, 1911, from Geo. Gynn. This was producing 60,000 daily, with two Horton machines and two American pipe rack driers. Immediately after the fire on the F plant they built two additional driers (made by the C. & O. Bartlett Snow Company) on the G plant and converted the conveyor system so they could use two machines for two shifts. These two shifts were made necessary by the fire, orders being on hand they had to fill. This two-shift plan proved so successful that it was adopted as the standard on the rebuilt plant. Each plant then produced 130,000 daily with the two shifts.

July 1, 1915, they purchased the Towle plant, with 105,000 capacity. They plan to put this plant on exactly the same basis as the other two.

The office of the company originally was at the F plant, but so large had the business become by 1912 that a downtown office was necessary. This is located in the Leader-News Building, on the second floor, where they have ample facilities. Eight men are employed here. Robert Mitchell was selected as sales manager in 1912. He knows the brick game from A to Z, and has proven a big factor in the growth of the business for the Farr Brick Company.

The advertising campaign started in 1912, but not on the extensive scale as in the spring of 1913, when the large BUILD WITH BRICK sign was erected.

The business grew from a small beginning in 1890, until today they are using eight trucks and a trailer and 159 head of horses in their delivery service. The horses are used in two and three-horse hitches. The delivery is by night and day, the night delivery being entirely by trucks. The Farr Brick Company placed an order this summer with a local truck company for one truck to be delivered each month for six months.

The total output of their three plants is one hundred million per year.

The No. F Plant of the Farr Brick Co., Cleveland, Ohio.

The F Plant.

This plant is located on Reeves avenue, south of Independence road, two and one-quarter miles, air line, from the square. There are eighteen acres of land here that have been cleaned of its clay; this is the site of the plant. The company owns 175 acres of clay land, averaging seventeen feet, of a surface stratum, and a twenty-foot bed of commercial building sand. There is an immense deposit of shale beneath this. A large ravine separates the clay land from the plant proper. This fact made it necessary for the company to erect a large suspension bridge, designed by John A. Roebling & Sons, of New Jersey. This bridge is 650 feet long, 450 feet between spans and cost $16,000. This suspension bridge was considered the most economical plan on account of the good location of the plant in respect to getting the finished product to the consumer. It has proven a paying investment, the actual saving being estimated at 6 per cent. on the money.

The clay is moved by means of a Thew O shovel, dumped into Atlas clay cars and hauled to the bridge by a Davenport locomotive, where it is attached to a cable and pulled across to a point directly above the clay bins by means of a mechanical hoist. The empties run back by gravity.

The clay goes through an automatic process; a chain drag clay feed takes the clay from the bottom of the bin and feeds it automatically into a Wellington crusher, thence conveyed to a two-way pug mill. The brick are molded in two C. W. Raymond Company Hercules soft-mud machines, from whence they are conveyed to a steam drier by a chain conveying system.

This pipe rack drier has a capacity of 130,000 daily. Eight hours are required in the drying. The brick are burned in five up-draft permanent wall kilns, fired with gas. Each kiln holds 480,000; it takes seven days to burn a kiln. The company owns its own gas wells, with more than sufficient gas supply. The wells are 2,450 feet deep. The pressure at the wells is 500 pounds (when operating, 800 pounds); the pressure is reduced down to fifty pounds in the service lines, and then to ten to sixteen ounces before passing to the kilns and boilers. The gas is handled through meters in order to maintain the economies and to know exactly the cost of manufacture. The gas is charged to the operation expense, the same as if purchased from a gas company. About 1,500,000 feet are used daily.

Sand Loader in Bank at Farr's G Plant.

At this plant is located a large garage for the six automobiles used. The same sized garage will be erected on the G plant.

An unusual sight for a common brick plant is an experimental laboratory. This the Farr plant possesses. Here are found a test kiln and drier, a ball mill, repress and various mesh screens, also appliances suitable for the work of making experiments in glazing common brick for facing work.

Plant G.

This factory is located one-fourth mile from plant F, on the Independence road. The company owns fifty-seven acres here, consisting of twenty-five feet of clay, twenty feet of sand (sold for commercial building sand; has as good quality as lake sand), seven feet of molding sand and a 300-foot stratum of clay.

The clay is taken off by means of a Thew steam shovel, while a Link Belt sand loader is operated electrically in the sand bank. The molding sand is used in all of their plants.

A brick tunnel has been constructed under the road. This will give them access to their other clay lands owned here.

The company has three gas wells on this property, which gives ample supply for every need.

The track in the clay field is built on a level with the top of the clay storage bin. An electric locomotive hauls the clay cars (Atlas).

The clay is dumped into a bin, which provides a large storage for clay. This plant has the same process and same equipment as the F plant.

The brick are burned in six up-draft kilns, holding 550,000 each.

There are two large barns here, housing 116 head of horses. A third barn, with 33 head of horses, is located at 3732 Broadway.

The barns at the G plant have elevating conveyors, driven by motor, for taking hay and grain into mow. This motor also operates a feed grinder. The horses are scientifically fed, great care and kindness being exercised. The barns are thoroughly clean and lighted with electricity.

The power of the plant is made with a 200-h.p. Skinner engine, direct fired with gas. This is connected to a Westinghouse generator and a Western Electric voltage regulator, which is an important item in controlling voltage changes, since it holds it uniform.

Brick Tunnel Constructed Near G Plant.

The F and H plants are steam driven, while the G plant is electrically driven. The H plant operates an Arnold Creager machine. A Wellington Clay Machinery Company drier, Thew steam shovel and Atlas cars are used.

The company drilled a gas well here this last summer and hit the lower vein at 2,800 feet, but not sufficient gas was found. Another well will be drilled later.

Barkwill Brick Company.

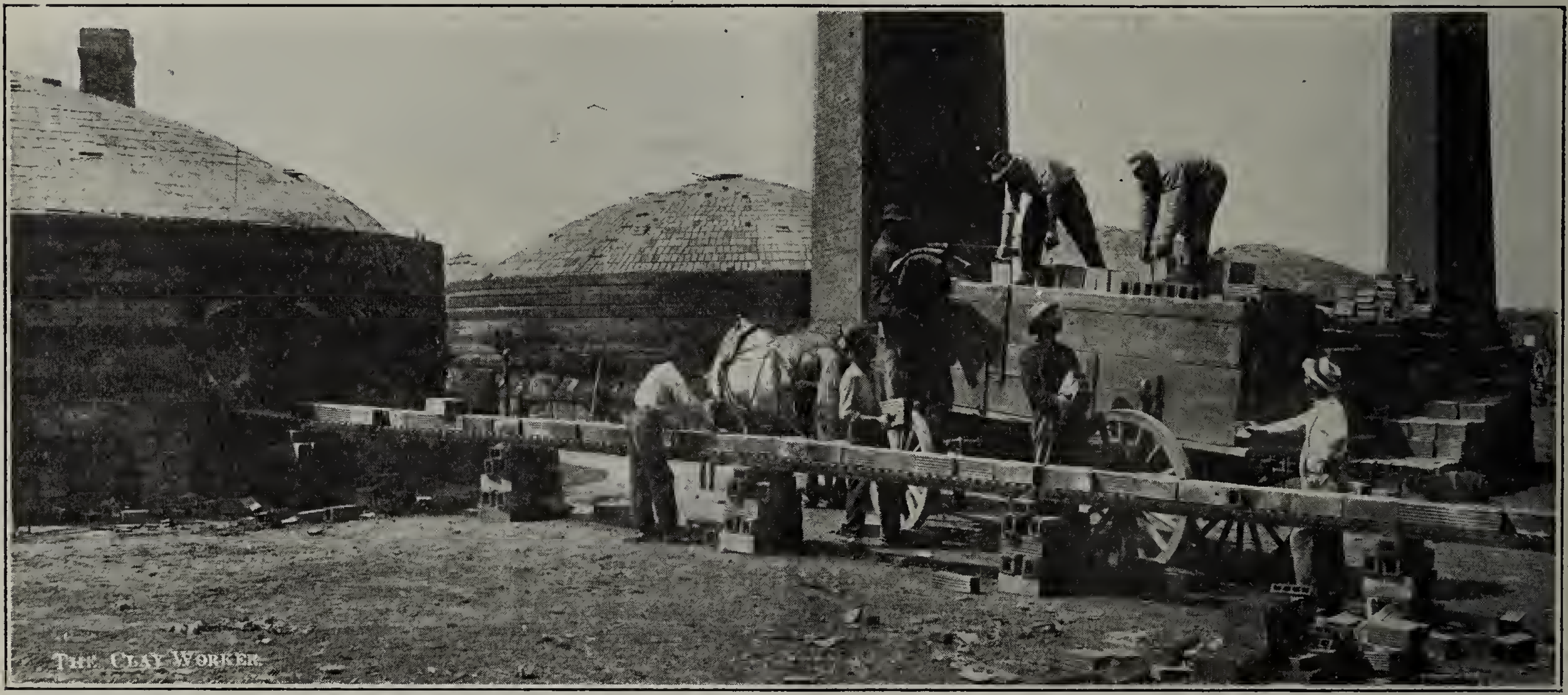
This is one of the pioneer brick concerns in Cleveland. Mr. Barkwill, the president, has been closely identified with the trade for the past fifty years. He succeeded his father in the brick business.

This company owns and operates two plants in Cleveland and is the selling agent for several others. On one of their plants they make 120,000 common brick daily, while on the other they manufacture 200 tons of hollow tile.

The brick plant is located at the foot of Seventy-fifth street, south of Kinsman road, about three and one-half miles southeast of the square. A large amount of stripping is done here, taken off by means of a Thew O shovel and a Brown

Thew Steam Shovels Operating in Barkwill Brick Co.'s Clay Pit.

Birdseye View of Barkwill Brick Co.'s Brick Plant.


THE CLAY-WORKER.

The Mathews Gravity Carrier System, the Greatest Time-Saving Device on the Barkwill Hollow Tile Plant.

Machinery Room, Barkwill Brick Co. Note Conveying System.

Kiln Yard of Barkwill Brick Co.'s Hollow Tile Plant.

hoist crane. A second Thew shovel (No. 1) is used in getting out the clay, which comes from a 25-foot stratum; 110 cars (2½ yards each) are taken to the plant daily. The cars are taken to the plant by means of a Wellington hoist and winding drum; the cars are drawn up a 45-degree incline, 250 feet long. Atlas side dump cars are used. The clay is dropped as needed into a roll crusher which has two sets of rolls, one 18 inches in diameter and 28 inches long, the other 20 inches in diameter and 28 inches long. These revolve at different speeds.

A Wellington special compound disintegrator, a Wellington single-geared pug mill, two Wellington machines, a Potts sander and the Wellington pallet system of drying are used here. The company expresses great satisfaction with this equipment. Sixty thousand brick are made daily on each machine in eight hours. One-inch pipe, 16 high, 5-inch center, equipped with No. 4 Lindstrom low-pressure steam traps, low-pressure valves, are used in the heating system. Standard cables carry the pallets to any part of the drier. The pallets are 12 and 10-gage steel, 10x38 in dimensions.

The brick are dried in twenty-four hours and then taken to the up-draft permanent wall kilns (seven, with 500,000 capacity each). There are three additional kilns which they use for storage in winter. These hold 400,000 each. The brick are burned with gas purchased from the city. Gas is proving a God-send to the Barkwill Brick Company, for they can make a better brick in seven or eight days than they could formerly in twelve to thirteen days. This plant is operated the year round. The market is Cleveland, the orders being filled by means of four Pierce-Arrow trucks and teaming, eighty head of horses being used.

A Novel Advertisement Used on Trucks of American Building Brick Co.

View of Wellington Dryer Showing Conveying System.

Their hollow tile plant is located within a stone's throw of the brick plant. Here they use shale. The plant formerly manufactured brick, but when the clay was exhausted the company turned their attention to the shale deposits located here, and soon began manufacturing a good grade of hollow tile.

Wellington Machine and Potts Sander on Barkwill Brick Plant.

The shale is mined with a Thew No. 4 shovel. The equipment of the plant consists of Atlas and Lakewood cars, two Bonnot 9-foot dry pans, and elevating machinery and American Clay Machinery Company's screens, pug mill, tile machine and cutting table. The plant runs on tile 4x5x12 and 5x8x12 for back-up block.

The machine is large enough to turn out 300 tons daily, but only 200 tons are made, due to lack of drier and kiln capacity.

There are 330 cars of the triple-deck type, 30-inch gage, roller bearing, 39½ inches wide, 84 inches long.

A 31-tunnel high-pressure steam dryer of their own design dries the ware in twenty-four hours.

The ware is burned in fifteen beehive down-draft 32-foot kilns; it takes 72 to 80 hours to burn with gas.

Some tile are sold outside of Cleveland, but the most of the output is disposed of in the city. Depressed tracks are built along the kiln yard, and the material is gravitated direct from kilns to cars by means of a Mathews gravity carrier system.

The officers of the Barkwill Brick Company are: C. G. Barkwill, president; E. S. Barkwill, secretary-treasurer, and E. J. McGettigan, sales manager.

This company is the selling agent of the Standard Brick Company plant, owned and operated by William Wallace, of Warren, O., president, and H. C. Bradley, of Urbana, O., secretary-treasurer and manager.

This plant manufactures soft mud brick on two complete lines of Wellington equipment. There is an unlimited supply of clay. This plant is twenty-six years old, and for the most part is similar to the Barkwill plant.

The Barkwill Brick Company also handles the output of the Cullen Brick Company, with their plant 3½ miles southeast of the square. The plant makes 30,000 soft mud brick daily, dried in a hot-air drier. This is one of the oldest plants in Cleveland. The product is of good quality.

The Plant of the American Building Brick Co.

This company has the distinction of being the only brick concern in the country possessing both gas and oil wells on their property. These give this plant a splendid advantage over the average brick factory for the simple reason that they do not have to purchase any lubricants or fuel of any kind.

The yard is four miles from the public square in the heart of the city, paved roads lead to the very doors of the plant thus giving them excellent facilities for quick delivery by truck or wagon.

This company is known all over Cleveland and the vicinity thereof by their large motor trucks with the bright red brick walls painted on the beds of same. This has proven a splendid advertisement for the company. They own and operate five six-ton automatic dump trucks of Peerless make, each holding 2,667 brick. Seventy-five per cent. of their haulage is done by truck while the balance is by team. The company attributes its success to the auto truck for it has extended their delivery to a large territory which otherwise they could not reach.

One of the American Building Brick Co.'s Trucks.

Mr. Lawrence B. Koblitz, the general manager and vice president of this company is considered one of the live wires in the brick game in Cleveland. He has had charge of this company's interests for the past twelve years, at the start of which they were making 30,000 daily but during the past dozen years the business has been developed to such an extent that they are not satisfied with their production of 100,000 daily. They expect to double their capacity this spring. The motto of this concern is "Watch Us Grow."

Mr. Joseph Koblitz is president and Mr. Louis Koblitz is treasurer. Both of these gentlemen were the prime movers of this company, but neither has been actively engaged in the manufacture of brick for a number of years, their chief business interests being in real estate. They are pioneers in this, doing business under the name of Koblitz Bros. Realty Company.

The equipment of the plant consists of a Thew steam shovel, Davenport locomotive and a complete outfit of Wellington machinery and drying system.

The ware is burned with gas in permanent wall kilns each holding from 750,000 to 1,000,000 brick. Thirty million have been made annually, the company being completely sold out each year.

The Cuyahoga Brick and Shale Company.

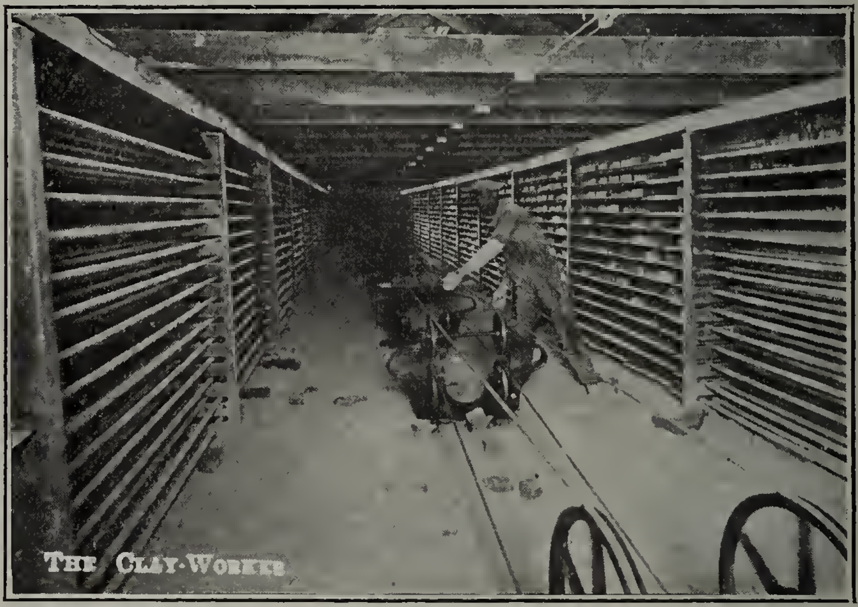
This is one of the new plants in Cleveland and has many fine features. A splendid quality of shale brick, hollow building blocks and drain tile of fine color are manufactured.

This plant which is five years old is located six miles southwest of the square. The company owns forty acres of rich shale land with no stripping, the face of the bank being about thirty feet. A Thew No. 2 steam shovel is used giving splendid service.

Lakewood clay cars carry the shale to the plant, a winding drum and cable is used to draw the cars upon a trestle where the shale is dumped on either side.

Conveying belts in the floor of the shale storage feeds the material into two Bonnot nine-foot pans as needed. Bonnot elevators take the ground shale to a point above the Bonnot screens. The screened material drops by gravity into a storage bin thence into a feeder supplied by the Louisville Ohio Machinery Company.

Davenport Locomotive Drawing Cars to Plant.



A Time-Saving Conveying System Conveying Brick From Machine to Rack.

A J. D. Fate & Co. combination pug mill and brick machine, a Louisville hand cutting table and a Bonnot automatic brick cutting table and Lakewood Engineering Company's cars are used.

An E. L. Rodgers eighteen-track waste heat dryer dries the ware most satisfactorily.

Two hundred tons of ware are made daily, burned in eighteen round down draft kilns, six of which are thirty feet, the rest thirty-two feet.

The ware is burned with gas purchased from the Berea Pipe Company.

An electric transfer will be purchased for hauling the cars from drier to kilns.

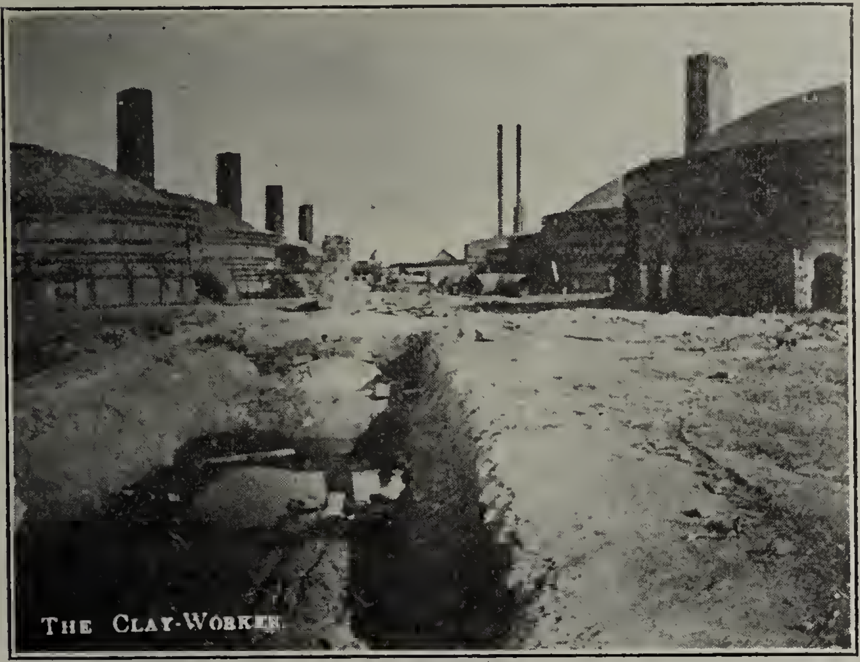
A Mathews gravity carrier system is used here to splendid advantage in emptying the kilns directly into the freight cars on depressed track running on either side of the kiln yard.

The ware is sold in Cleveland for the most part.

The power of the plant is obtained from a 300 horse-power Miller gas engine. There is a 65 horse-power engine for electric lighting.

The officers of this company are W. H. Carder, president; J. G. Litzel, vice president and R. J. Dawson, secretary-treasurer and general manager.

The officers of this company are enthusiastic members of the Society Advocating Fire Elimination. They were among the first to join that thriving organization, which deserves the hearty co-operation of every clay product manufacturer in the country.



Kiln Yard, Cuyahoga Brick and Shale Co. Note Kiln Bands.

Emptying Kilns with Mathews Gravity Carrier System.

The Plants of the Camp Conduit Company.

This company is a large producer of hollow ware, they own and operate two factories in Cleveland. One known as the Independence plant, is located eight miles from the public square, while the second is only four miles from the center of Cleveland, at Forty-eighth street and Denver avenue. The former was built in 1907 while the latter was erected in 1910. These two factories have been under the same management from the beginning. About fifty thousand tons of ware are made annually consisting of hollow building material including floor arches and partition tile. These plants are operated the year through. Seventy acres of shale land are owned at each plant with similar formations each having a seventy-foot face.

The material is blasted and taken to the plants up inclines by means of winding drum and cable. Dry pans (Phillips McLaren and American Clay Machinery Co.) are used in both factories but the Independence plant uses two wet pans (Taplin-Rice-Clerkin Co.) also two Taplin-Rice-Clerkin Company's steam presses. The E. M. Freese Company combined machines are used.

Waste heat is used in the drying at the Forty-eighth street yard while exhaust steam is used at Independence. It requires two days to dry with exhaust steam and ten hours to dry with waste heat.

The ware is conveyed from machine to dryer and dryer to kiln by means of dryer and transfer cars; coal is used in the burning. There are thirteen round down draft kilns at Independence while eight kilns suffice at Forty-eighth street. Each kiln is turned weekly.

Mr. H. H. Camp is manager of the company, Mr. Joe Steober is the superintendent at the Independence plant and Mr. W. J. Baker at the Forty-eighth street factory.

Office and Gas House of Cuyahoga Brick and Shale Co.

A large amount of this company's product was used in the Hotel Statler.

The Ohio Clay Company.

This firm manufacturers a high-grade building tile with an enviable reputation throughout the length and breadth of this country—the product is known as the Denison interlocking tile, it is used for bearing walls, curtain walls, foundations and partitions in all classes of building being particularly adapted for walls which are to be covered with stucco or faced with brick. Walls made of this tile have great strength, are non-conductors of heat and cold and are moisture and dampness proof.

The company not only owns and operates several large plants, being large producers, but have licensees in various parts of the country operating under the patent rights of the Denison Tile Engineering Company. It is a live organization that operates on a large scale. Their clever magazine, The Interlocker, issued monthly from their Cleveland office is well known to the trade in general. It shows the up-to-dateness of this busy concern.

The Cleveland plant is located six miles south of the square on the B. & O. railroad. They own 70 acres of rich shale land, the bank consists of a 75-foot face with an unknown depth of fine shale below. There is no stripping; the bank is blasted and the raw material taken to the plant in Atlas cars drawn by an Atlas electric transfer. Three cars of shale are taken at a time, the cars being pushed on to the transfer as shown in one of the illustrations. An unusual feature of these cars is its dumping arrangement; this was the idea of Mr. George Denison. Look at the front car in the illustration of same on page 31, you notice a slit in the side of the car and a steel arm extending a short distance beyond the end. The wheels of the car are a little off center making it easy to up-end the car. At a point above the shale bin the arms on these cars catch on a rail which holds the end gate when the car is up-ended. These cars are eighteen inches high and hold one yard of material. Seventy-five cars of shale are used daily.

The shale is shovelled from the storage bin into three American Clay Machinery Company's dry pans. The material is elevated to the top of the building where it passes over piano wire screens, two of which were furnished by the Manufacturers Equipment Company, while a third by the Ceramic Supply and Construction Company. A conveyor belt carries the screened clay to a clay storage bin from which it drops by gravity into a J. D. Fate Company hollow ware machine. Fate cutting tables are used.

Plant and Stockyard of the Ohio Clay Co. Note the Large Continuous Kiln.

The writer was much impressed with the great speed being made at this plant; they were making hollow brick the day we were there at the rate of 108,000 in ten hours. They make about an even quantity of hollow tile and hollow brick at these plants weekly.

Two hundred double deck dryer cars are used of the Lakewood Engineering Company and Atlas Car and Manufacturing Company make.

An Atlas electric transfer car is used for transfering the dried ware from the twelve track waste heat dryers to the two (fourteen chambers each) compartment kilns. The dryer and kilns are of the company's own design. These continuous kilns have proven most satisfactory for their work, the heat from the cooling chambers is used in the dryer and also for water smoking the newly set chambers. Eighty tons of ware are set in each compartment.

Slack coal is used as fuel for one of the kilns, this is fired entirely from the top. The other kiln is fired with natural gas, purchased from the East Ohio Gas Company. The ware is under fire five days, two chambers are burned daily. Depressed railroad tracks run along the kiln affording splendid loading facilities.

This plant is electrically driven throughout, General Electric Company's equipment is used. The electricity is purchased from the Cleveland Electric Illuminating Company.

The water supply is obtained from a large reservoir filled with spring water.

The officers of the company are W. C. Denison, president and general manager, and G. W. Denison, vice president, secretary-treasurer and superintendent.

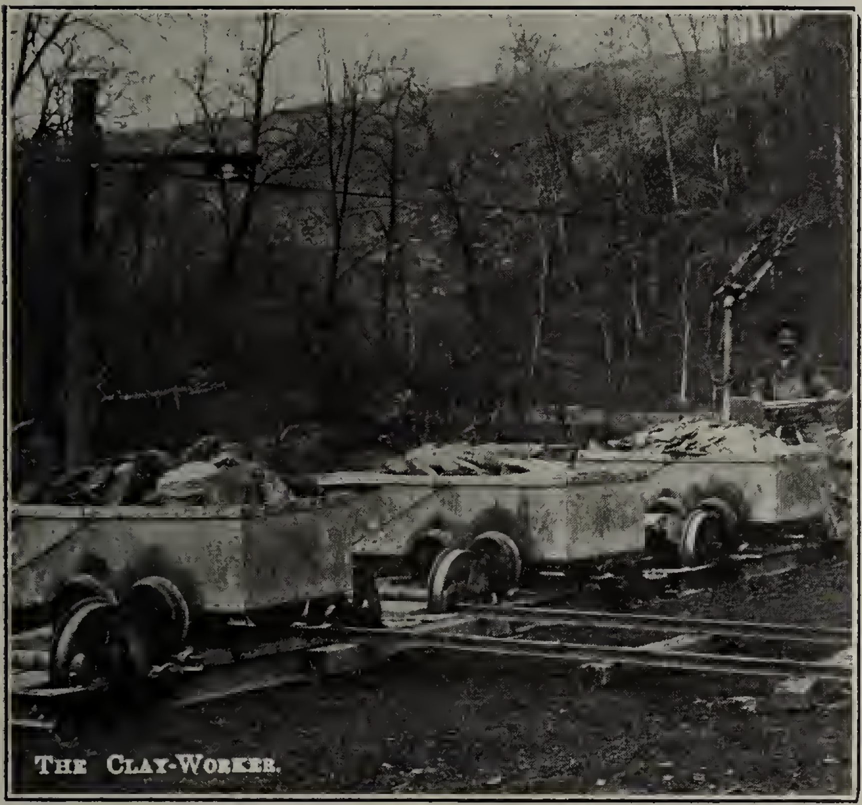
Murray Brick Company.

This is practically a new plant, it has not been in operation long but is making one of the finest red brick manufactured anywhere in Ohio.

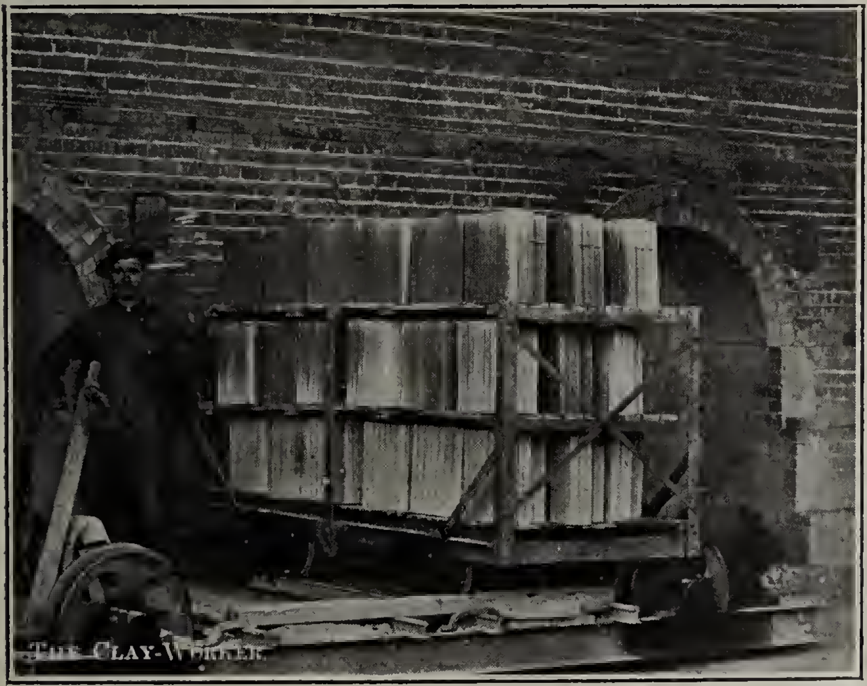
It is an eight-kiln plant situated on a beautiful hillside from which you can look across a valley a great distance.

They use a very hard blue shale here blasted from a twenty-foot face bank close to the plant. The shale is loaded by hand into wheelbarrows and wheeled to the pan room, where it is dumped into a Stevenson pan—the company is high in

Shale Bank of Ohio Clay Co.



Cleverly Constructed Clay Cars with Automatic Dump Device.



Atlas Electric Transfer Car Used on Ohio Clay Co. Plant.

its praises for this type of clay pan and will purchase a second very shortly.

The ground clay goes through the usual process, the equipment being that of the E. M. Freese Company.

The ware is dried in a twelve track steam dryer of the company's own design, Lakewood Engineering Company's cars are used.

The ware is burned in round down draft thirty-two feet kilns.

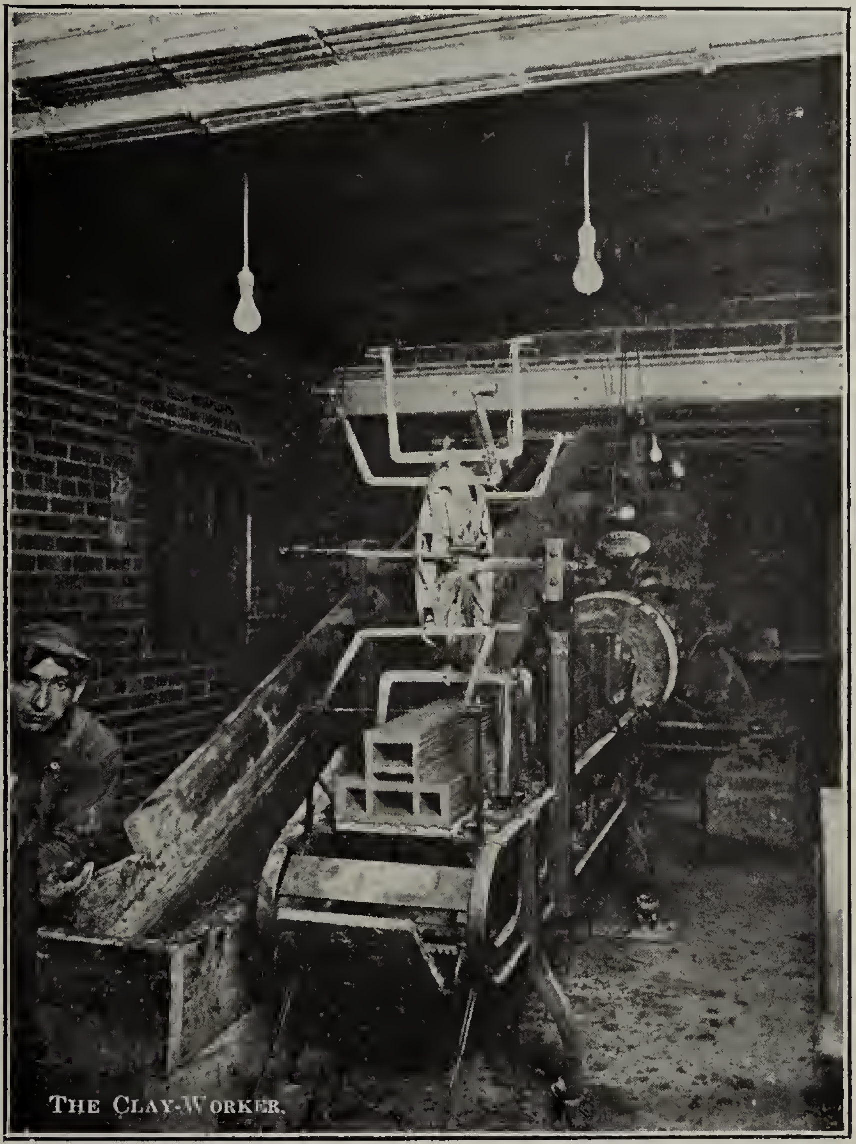
The Beighlee Pyrometer system is to be installed here.

The plant is some distance from the railroad and a switch has not as yet been provided.

The brick are taken to their market (Cleveland) by means of Peerless trucks which hold 2,000, these trucks bring supplies of coal to the plant on the return trip.

The company claims these trucks really save them money over the railroad transportation because of the freight rates, the cost of storing or changes in route and hauling in Cleveland.

The officers of this company are Adam Hoffman, president; George J. Murray, general supterintendent; C. A. Chapman, secretary-treasurer, and V. Boswell, superintendent.



The J. D. Fate & Co.'s Cutting Table for Hollow Tile.

Plant of the Hydraulic Pressed Brick Company.

A most interesting clay product manufactory in Cleveland is that of the Hydraulic Pressed Brick Company, a large holding company with a score or more plants located throughout the Central States.

The Cleveland factory was formerly known as the Cleveland Vitrified Brick Company. The name was changed twenty years ago when the Hydraulic Pressed Brick Company purchased same. This was the plant that former president W. H. Hunt managed.

The general manager of the Cleveland plant of the Hydraulic Pressed Brick Company is Mr. Chapin, a progressive gentleman with wide experience in the brick game, being connected with this same company at their main St. Louis plant for many years. The Cleveland plant has been under the present management about seven years.

This factory manufactures a high-grade face brick exclusively, about sixty thousand being produced daily throughout the year. Standards, Roman, Norman and special shapes are made. The company owns rich deposits of red and blue shale and red clay averaging sixty feet in depth. There is thirty feet of the red clay and shale and thirty feet of the blue shale.

The materials are taken from the bank by means of a steam shovel. The dry pans, screens, machinery are of the E. M. Freese Company and the American Clay Machinery Company makes.

THE CLAY-WORKER.

Mr. Chapin, Manager Cleveland Hydraulic-Press Brick Co.

Panoramic View of Hydraulic-Press Brick Co.'s Plant.

The brick are dried in a waste heat dryer (28 to 50 hours) and burned in ten kilns of 125,000 brick capacity each. Eight days are required for the burn.

The wagons are backed into the kilns and loaded. The output of this factory is sold for the most part in Cleveland and northern Ohio. The price obtained in Cleveland is from sixteen to twenty dollars, depending on texture of brick.

Mr. W. H. Erskine is the superintendent of this plant.

Note—The paving brick interests of Cleveland will be described in the February issue. This will include write-ups of the Metal Paving Brick Company (The Deckman-Duty plants), the Newburg Brick Company, the Cleveland Brick and Clay Company and the Metropolitan Paving Brick Company.

PACIFIC NORTHWEST CLAY NOTES.

THE various reports published in this section of the increased activities in the Eastern States has done much to relieve the present stagnant situation in the Pacific Northwest. Confidence has not entirely returned, nor has building increased to any extent, but the general feeling is of a much better tone, than it was few months ago. Statistics of the building operations for the entire year show for all Pacific coast cities a great falling off from last year, but it is pleasant to record that the last two months of 1915 showed a decided gain for the first time in several months past; this is with the exception of the British Columbia cities, for Vancouver, B. C., showed the lowest building operation in November for the whole year and its total amounted only to $13,800. Compare this with a total building permit operation of $798,810 for Seattle alone, it must be concluded that things are dead across the line.

Machinery Room of the Hydraulic-Press Brick Co.

A High Grade Face Brick Is Made on the Hydraulic Plant.

The use of Pacific Northwest materials for government building comes up every time some new building for the government is ready for the contractors to figure on. For the new postoffice building to be erected in Portland this year, the use of native limestone and native brick facing are now considered. The specifications will be open so that native limestone may compete within the required specifications as to color and composition. Concrete will also not be used in the upper structure because of the continued inspection necessary during erection. Government inspectors are so limited in number that several buildings are assigned to one man, so he may go from one to the other. If concrete type were used an inspector would have to be on the job every day to watch the cement materials as it was poured.

In former years, before the war, sailing vessels from England usually brought fire bricks as ballast, but since the war evidently such fire brick are not available for ballast, and it was rather surprising last month to see the French bark Pierre Antoine unload her ballast consisting of old bricks and other discarded building material which was loaded on it at Belfast, Ireland last summer. On the water front are samples from all parts of the world in the way of earth, clay, gravel, broken bricks, tile and other materials that has been utilized as ballast.

A company has been formed in Oregon, which claims to have a process to make a rubber substitute out of Oregon clays. The capitalization is one million dollars. Clay must be valuable in Oregon.

Mr. T. S. Mann, of the Pacific Stoneware Company, of Portland, will attend the short course of the Ceramic Department of the University of Illinois at Urbana. Mr. Mann intends also to visit the various clayworking establishments while East.

The Denny-Renton Clay & Coal Company will erect a new warehouse in Tacoma on the waterfront near Fifteenth street.

Mr. S. Geijsbeek, secretary of the Oregon Clayworkers Association will read a paper, "Materials for Drains", before the convention of the Oregon Drainage Association at Corvallis, Oregon, next month.

The Walla Walla Brick Company has furnished over 80,000 brick for the new St. Mary's Hospital, which is now being erected at that place by Beezer Bros., contractors.

The Chehalis Brick & Tile Company, of Chehalis, Wash., has closed a contract to furnish 325,000 brick for a new refuse burner for a large sawmill on Gray's Harbor.

The Columbia Brick Works, of Portland, Ore., have secured a large contract for hollow tile to be used in the dry kilns for the Brooks-Scanlon Lumber Co. This company now has furnished the tile for some twenty dry kilns in the Bend, Oregon, district.

The annual meeting of the Oregon Clayworkers Association will be held in Albany, February 9 and 10, and judging from the enthusiasm displayed at former meetings, the attendance will be large. Clayworkers from the whole Pacific Northwest are invited to this meeting.

A new brick plant will be erected this spring at Roundup, Montana, by Messrs. Moshner and Klein. The clay has been tested and will make good brick. It is estimated that they will make about 100,000 brick the first season.

Floor Tiles—Clay floor tiles should be made in color to match the surroundings for which they are to be used. For public places, and there where the traffic is very large, floor tiles made of the same material as paving brick and burned to a brown-black color are the best to be used. For halls, restaurants and garden places, a good red color and also a yellow color are often used. It is easier for the manufacturers to burn a yellow or buff burning clay to vitrification than a red clay, and therefore the buff colored tiles are more used. The tiles will last longer if they are nearly vitrified, and tiles with a high porosity, say from 6 to 12 per cent., should not be used in such places. The stoneware floor tiles are used a great deal, also, and their color varies from a light yellow to a steel gray blue, all according to their hardness. The stoneware floor tiles are preferred by a great many architects and builders, and, in fact, can be considered the best floor tiles on the market.—Deut. Topf & Z. Z. No. 27, 1915.

WHEN A STATE EXPLOITS CONCRETE.

SOME OF THOSE in the clayworking industry, interested in pushing the use of brick and tile for silo construction, are well enough aware that here and there throughout the country certain state agricultural departments have been negligent about experimenting with or recommending clay products for this purpose. The clayworkers themselves feel, too, that they have to shoulder part of the blame for this, because they have not been actively on the job and bringing their product to the attention of these departments. The thing that caps the pile, however, is to find a state agricultural department not merely passively recommending, but actively exploiting, concrete for silo construction. And that is just what was found at the Kentucky state fair, held in Louisville the week of September 13 to 18.

Down one of the fair ground alleys or streets there was quite a display of silos, five or six different wooden offerings, and down toward the end were two sections of silos made of row, a concrete silo.

In visiting along the row to see what was being exploited of Pittsburgn, and just beyond this, making the end of the hollow clay blocks, by the National Fire Proofing Company, and what claims were being put forth, the writer finally came to the concrete silo, which showed no firm name or advertising matter on the silo itself. A man was found installed in a sort of boothlike place, in charge, however, and when inquiry was made as to his name and the firm exploiting the concrete silo, it was learned that the gentleman in charge was J. A. English, of Columbia, Ky., who was not representing any firm, but was representing the agricultural department of that state.

Naturally this seemed a bit astonishing, and there was no hestitancy about asking him why it was. He was found to be not only recommending the concrete silo, but had some models of the forms used in its construction, and was informing visitors that they would loan the forms free and furnish instructions for the erection of these silos.

On the writer insisting that he explain why they were exploiting the concrete silo with state authority, while individual firms were exploiting silos made of two other materials on the ground, he said that they did it because they had experimented and come to the conclusion that the concrete silo was the best and the most durable; therefore, having only the interest of the farmers at heart, they were recommending these to the farmers.

Since he put some emphasis on the point of durability of the concrete silo, the writer asked him if he thought the concrete silo more durable than salt-glazed, burned clay blocks, shown right adjacent to it by the National Fire Proofing Company.

He confessed that he didn't know, and finally said he thought they were now building a hollow clay block silo for experimental purposes.

Finally, after the writer insisted that he was putting the state in a questionable attitude, and that it was not fair to other offerings, he requested that the writer call upon Commissioner Newman, in the temporary offices at the Administration Building.

A call upon Commissioner of State Newman failed to develop any more satisfactory answers than were obtained from the man in charge of the concrete silo. Inquiry as to whether the state built the silo at its own expense, or whether the material was furnished or the work done by the cement people, brought no satisfactory answer. Neither could information be obtained as to whether the cement people were contributing in any way to this propaganda of concrete silo exploitation.

The one stubborn fact that stands out conspicuously is that the agricultural department of the state of Kentucky has been actively exploiting concrete for silo construction, recommending it as the best and most durable. Surely this is a condition of things that calls for attention from that branch of the clayworking industry that is interested in promoting their products for silo construction. It is also a reminder that conditions of the same kind may exist in other states and that if the clayworkers want their share of this business they should get busy and see that their product has a proper hearing both before these people in charge of agricultural experiments and before the public in general.

THE BURNING OF FACE BRICK IN DOWN=DRAFT KILNS

D. H. Applegate, Jr., Red Bank, N. J.*

THE COMMERCIAL PRODUCTION of face brick of uniform quality and predetermined color is fraught with many difficulties, which arise to combat the manufacturer at every stage from the winning of the clay to delivery on the job, but the greatest of these occur in the kilns where their development cannot be seen, and often their true cause can with but difficulty be determined. It will, of course, be impossible within the limits of a paper of this kind to treat so vast a subject with anything like thoroughness, but it will be the chief object of the writer to inquire into some of the chief difficulties encountered, and if possible to discover their causes and remedies. These difficulties resolve themselves naturally into two classes, physical and chemical. The former in general affect the structure of the ware and the latter the color, although in some cases the functions overlap.

The chief causes of imperfect goods may be found in the following list of defects, one or more of which are encountered by nearly every manufacturer: Checking, warping, uneven sizes, scumming or whitewash, flashing when not wanted, uneven or undesired coloring, over and under burned brick. These may be induced by unsuitable material or unsuitable processes of treating it.

We will assume that the manufacturer of face brick has material which is known to be suitable to his purposes. Let us then take a hasty glance at his clay pit and factory to see that his brick are properly equipped for their ordeal by fire, from which they should emerge perfect building units of the quality and color which it has been determined to produce. In order that the burner may bear his full share of responsibility we must see to it that faults which develop may be properly charged to him and not to some treatment encountered between the clay bank and the kiln.

Making the Ware.

At the clay pit or mine care should be exercised that only proper material is loaded and all other substances rejected. Upon this hinges the success of all later operations.

In the molding department proper mixing and tempering, machines designed and adjusted to suit the ware, dies through which the clay will flow evenly (if the process be stiff mud), and careful handling must be had. Otherwise checking, warping and uneven sizes may be engendered at the very beginning of the process. If, in the stiff mud process, part of the column tends to emerge from the die at a faster rate than the rest, a tendency to warp after the brick are cut is apt to be found, and strains which induce checking are sure to be present. If the temper of the clay varies or the column is buckled by improper action of the cutting device, one of the causes for uneven sizes is located. In the dry-press process, varying moisture content will help to account for variable shrinkage. Wedging of the clay in the molds, because of lack of heat or the plasticity of the clay, will produce layers of unequal density which may induce checking or complete rupture.

Drying.

Drying may be responsible not only for checking and warping, but for scumming as well. In the former case the fault lies in subjecting one part of the brick to a stronger drying influence than the other. One side may receive more heat and air than another, or the outside may dry before the interior and hence set up unequal strains. The ideal drying condition is one in which the whole mass of the brick becomes heated through to a point where evaporation is induced throughout the body before any moisture is permitted to escape. This may be accomplished by heating up in a nearly saturated atmosphere and then gradually advancing the temperature while decreasing the moisture content as is done in most of the artificial heat dryers. In this way the moisture is rapidly expelled from the interior of the ware and the whole mass dries at nearly a uniform rate without setting up strains which might cause either of the beforementioned defects.

Scumming or Whitewashing.

Scumming, or the deposition of a film of soluble salts on the surface of the brick, may be intensified by either too slow drying or the presence of sulphurous gases in the dryer. It is apt to be worse in weathered clays than freshly mined ones, especially if pyrites be present, unless the weathering be accompanied by a sufficient leaching action to remove the soluble salts. This is seldom practical with brick clays. Just why slow drying has the effect of bringing these salts out more than rapid drying is not entirely clear. One theory advanced is that a sort of osmosis is set up causing the salts to be filtered out of the water when it moves quickly through the porous structure of the clay, but that when the movement is slow the salts get past the barrier and move freely to the surface. The opinion of the writer, however, is that in rapid drying the water vaporizes in the pores before quite reaching the surface and leaves its salts in the layer adjacent to the outside but not reaching it. This action holds good in case only the less soluble salts, such as carbonates, are present. If the highly soluble sulphates are present they are almost sure to appear on the surface, as it is probable that the subcutaneous pores will be unable to contain all the solid matter that is carried in solution by the water. In the case of direct fired dryers where the gases mingle with the ware, or waste heat dryers drawing upon burning kilns, the sulphur present will change the comparatively harmless carbonates to soluble sulphates which will readily follow the water to the surface and deposit there as shown above. If sulphates are present in the clay it will probably be necessary to use barium carbonate to reduce them to the insoluble form, and Dr. Seger recommends in some cases the additional use of barium chloride with the carbonate. It must, however, be borne in mind that the treatment is not effective against exposure to sulphur gases.

The writer had occasion to note a case in point a few years since when a manufacturer of red-burning shale brick became greatly troubled by this evil and was at a loss to find a remedy. He had remodeled his dryer from a radiation furnace type to the waste heat system with an auxiliary direct fired furnace. With the installation of the new system came the scum. He then tried for purposes of experiment the air drying of a few cars of brick, and found that the results were quite as bad. This convinced him that he had run into a bad vein of shale, but on getting no better results from other parts of the quarry he was driven first to one experiment and then another, among which was the use of barium carbonate, until he had wasted a considerable sum of money and made a large amount of unsightly ware. He was easily set straight by cutting off the furnace and scaling up the leaky dampers between burning kilns and the waste heat duct. No more scum appeared and no barium was needed.

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*Reprinted by permission from the report of the New Jersey Clayworkers' Association.

As to the efflorescence which appears on the brick after laying in the wall, most manufacturers assume an attitude of indifference, but it adds nothing of credit to the reputation of their ware and should be overcome as far as possible by hard burning, though in many cases it is due to filtrations from the mortar penetrating the brick with lime and magnesium salts in solution.

Setting.

In order that brick may be properly burned they must, of course, be properly set, due regard being had for proper spacing, plumbing, and tying in to prevent rolling. Spacing will vary with different classes of ware and different types of kilns, but ordinarily the spaces between the brick should comprise from one-third to one-half of the volume of the brick themselves. In burning for a clean, uniform color the general practice is to set two courses with faces together and then cross with two more courses set the same, but in some cases, especially with dry-press goods, three courses are faced before reversing. This has the advantage of giving one-third of the brick two good faces, which increases the chances of getting perfect ones and makes pretty samples to send to the uninitiated, but it makes the ware less steady under fire and is of doubtful advantage. In the case of burning for a flash, the brick are generally set on the flat five or six courses high and then crossed in the same way. Often the upper part of the kiln will be set in this way while the lower part is set as previously described. This is only advantageous when a wide variety of color is desired.

Burning.

The successful burning of a kiln of clay wares depends very largely upon a previous knowledge of the qualities of the material and a strict observance of the conditions necessary to produce the results desired. It would, of course, be a waste of time and fuel to burn an open-grained porous body comparatively free from combustible content with the same care which would have to be used upon a dense carbon-bearing clay, and conversely, if a clay of the latter sort should be handled solely with the idea of saving time and fuel, a more or less complete loss of ware would result from the attempted economy. It is well known that certain types of kilns will burn some clays perfectly and fail lamentably upon others, and yet it does not follow that there are not kilns which might burn almost any clay successfully if properly managed. The essentials of a good down-draft kiln are furnaces of ample capacity and such design that complete and economical combustion may be had, a flue system and general design that will give even heat distribution, and ample draft easily controlled by dampers in such a way that the heat may be guided at will to any portion of the kiln. In order to properly control the burning conditions, it is necessary to have a number of spy holes located at different points from crown to floor, and the setting so arranged that a clear view may be had through them from one side of the kiln to the other. In these openings should be placed, not too near the outside walls, Seger cones, and if necessary a number of trial pieces. At the point where the cones are located, the covering over the spy hole should be tight, so that no flame may play directly upon them. In addition to this an electric pyrometer with two or more thermocouples should be installed. One should be placed in or near the crown, and one near the floor. Others, if desired, may be located where experience dictates. A draft gauge is also a very useful instrument for determining and maintaining the proper degree of draft for the different stages of the burn. Its use enables burners to duplicate conditions which have been proved to be best suited to the work much more accurately than could be done by guesswork or arbitrary placing of dampers. In some cases apparatus for making gas analyses is of great assistance, though unless used by one having the requisite knowledge and judgment, its value would be doubtful and its use might as easily induce errors as to correct them. This would be especially true of clays containing carbon and carbonates where large quantities of CO_2 are given off at certain stages of the burn. An experienced burner can generally tell with a fair degree of accuracy the conditions of atmosphere in his kiln. One very good gauge is to have a small opening near the top of the kiln which can be seen by the burner. If the escaping gases show a flame on contact with the air it is certain that some reducing action is taking place. With these safeguards provided, and a knowledge of the clay to be burned and results desired, it should not be difficult to produce a reasonably good kiln of ware.

Water-smoking.

On lighting up the kiln the fires should for the first six hours be kept as low as they can be made to burn. When a temperature of about 200° F. has been reached half way down the kiln and steam begins to evolve freely, the fires can be increased slightly to a point where they are not likely to die out from lack of body. The rapid evolution of steam in the upper part of the kiln will keep down the tendency to increasing temperature. In this way they should be carried until the lower thermocouple indicates a temperature of from 350° to 400° F., showing that the steam has passed off and that the ware is ready to absorb heat. During this period the strongest draft possible should be maintained with plenty of air over the fires to draw away the moisture and prevent it settling upon the lower courses. A too rapid evolution of steam should be avoided for the same reason. This, if properly done, is an excellent prevention of kiln scumming. It is very essential that a uniform low heat should be maintained during this period, for if too rapid heating takes place, the formation of steam within the ware may be such as to cause spalling. The duration of the drying off period will depend entirely upon the nature of the clay and the size of the ware. Twenty-four hours are in many cases ample, while eight to ten days are often found, or thought to be, necessary. The question of the proper fuel to be used at this as well as subsequent stages of the burn will be taken up later.

After the kiln is dry the fires may be raised slightly to effect a gradual heating up, which should be in most cases not more than 500° F. per diem for the next two days. During this time expansion, due to increasing temperature, is constantly taking place, and if it be sudden and unequally distributed through the individual brick, they will be very apt to develop fire cracks, which occur principally at this period.

Quartz at a temperature of about 900° F. undergoes a crystalline change with an accompanying sudden expansion. In highly silicious clays, unless this change takes place simultaneously throughout the body, such unusual strains are set up that checking and often bad cracking are almost sure to result. Great care should be taken not to permit any loss of temperature at this stage, for on second heating the same thing takes place again and is apt completely to rupture the already weakened ware. It is at this stage also that the combined water of the clay begins to pass off. This process continues until a bright red heat is attained, when all the water of crystallization will have disappeared. This stage is not of itself dangerous, but should be given ample time in which to become completed before oxidation gets well under way, so that no obstacle may be offered to the free circulation of air through the brick to carry on the oxidizing process.

Oxidation.

At about the point where the first dull red color shows, oxidation of the combustible content of the clay begins. This in some clays is another distinct danger point, and may, if not properly managed, be the occasion of ruining a considerable amount of ware. Directly traceable to improper oxidation are black cores, cracking, bloating, and in light-burning clays the production of dull ashy colors. The methods of eliminating combustible content vary greatly with different materials. With an open-grained clay, having a not too great combustible content, little care need be taken except to keep a strongly oxidizing atmosphere in the kiln and to prevent the temperature of incipient vitrification, or the closing of the pore spaces, taking place until the blue hazy vapor has entirely passed off. With a higher combustible content or a close-grained clay more care must be used to keep an even temperature, as the combustion taking place within the brick is a source of considerable heat, and may, with only a little help from the fires, bring about a vitrifying temperature before it is desired, or produce spots of local heat in the kiln. The writer has seen a clay of this nature, burned in a center-draft kiln with a strong draft, take fire at the sides and bottom and vitrify there before the top was even red. In a case of this kind the draft should be kept low and the fires light until all combustible matter has passed off. In extreme cases it is sometimes necessary to close the dampers almost tight and keep the fires low and smoky to prevent the access of sufficient oxygen to carry forward the combustion at its normal rate, which would over-burn the ware. This is particularly true of lime and iron-bearing clays, which mature at a low heat and fail to close to the vitrification point. After treatment of this sort a strongly oxidizing atmosphere should be maintained for some hours before the temperature is allowed to increase so as to oxidize the mineral contents of the clay, which have been kept reduced by the presence of carbon and sulphur during the previous stage. The most common minerals found in clay which are subject to change at this period besides carbon, iron pyrites, FeS_2, iron carbonate, $FeCO_3$, and calcium carbonate, $CaCO_3$. Carbon is more active toward oxygen than sulphur, and, hence, until all the carbon present has been oxidized, either by the kiln atmosphere or at the expense of the mineral oxides present in the clay, very little of the sulphur will be given off. Following the expulsion of the carbon the iron pyrites, FeS_2, will begin to oxidize, but this action proceeds slowly and generally does not reach completion. The result of this action is the formation of FeO and Fe_3O_4, which later, if oxidation be strong, will become Fe_2O_3. Also, the lower oxides of iron and metallic iron which were reduced by the carbon and sulphur change gradually to the ferric form, while the carbonates give up CO_2 and revert to the oxides. If vitrification begins before this final oxidation is complete, the sealing of the pores at the surface will prevent the further penetration of oxygen to the center of the ware, and the familiar black coring due to the lower oxides of iron will result. As vitrification proceeds inward, the silica, which is more active toward iron than is sulphur at high temperatures, will replace the latter in the iron compounds. The sulphur is then freed as a gas under high pressure, which in the softening matrix produces vesicular structure with attendant bloating. The best precaution against this is having the brick bone dry before setting so that oxidation may not be delayed by the prolonged evolution of moisture. If no sulphur be present in the clay, black coring may occur from incomplete oxidation, but bloating will not be apt to. In clays containing carbon and sulphur but no iron, the bloating would take place with black coring, and in clays high in sulphur, but free from iron and carbon, swelling would take place, beginning at the outside. These facts are laid down by Prof. Orton, and he credits sulphur with being the chief cause of bloating. He also scouts the time-honored theory that ferrous iron is a more active flux toward silica and silicates than is ferric. There are strongly conflicting opinions on this point, hence no dictum on it would at this time be of value without the support of fairly conclusive results of further investigation.

Vitrification.

The last or so-called vitrification stage of the burn will determine the hardness of the finished product and the color. The course of action to be pursued here will depend, as formerly, upon the nature of the clay and the results desired. The classification of clays according to their behavior during the vitrification, or, more properly speaking, the fusion stage of the burn, shows three different types: Those low in iron and generally also in lime; those containing at least 4% Fe_2O_3 (sufficient to produce a red color) and low in lime, and those containing sufficient iron to produce a red color but with the accompaniment of enough lime to bleach it. Clays of this nature generally contain twice or more as much lime as iron.

Draft Regulation.

Assuming that oxidation has been properly carried through at as low a temperature as is feasible, it is now safe to heat up the kiln as rapidly as possible until the top courses approach the finishing temperature. Then the fires must be maintained at nearly an even temperature until the desired degree of heat has penetrated to the bottom courses. This can best be accomplished by so regulating the draft that over-production of heat is avoided and at the same time free movement of the fire gases through the kilns permitted. There have been many schemes devised for getting an equal distribution of heat throughout the kiln, most of which are remarkable for their worthlessness. They generally involve alternately raising and lowering the draft or overheating and undercooling the furnaces. These practices involve loss of fuel and injury to the ware, and make it almost impossible to get an even burn. By using the right draft and producing just the proper degree of heat, it is not difficult to burn a kiln with a variation of not more than two cones between crown and floor. The draft gauge and pyrometer are of greatest assistance in accomplishing this. The lower the draft compatible with proper kiln conditions and heat production, the nearer equal will be the top and bottom temperatures.

With the light burning semi-fire clays low in lime and iron, strongly oxidizing conditions should be maintained throughout to keep the iron in the ferric form. If periodic reduction takes place, especially in highly silicious clays, part of the ferrous iron in combination with the silicates present will become fixed and resist the reoxidation which would otherwise follow. Besides this if sulphur be present in the fire gases it will, in the case of reducing conditions, attack the iron in the clay forming FeS_2, which on reoxidizing will impart a darker color to the ware than it previously had. At about cone 11 or 2462° F., ferric oxide or ferric silicates become deoxidized, forming ferrous compounds which impart a darker color to the ware and give the appearance of flashing. Hence in producing light-colored ware it is necessary to avoid reaching this point, which is often but slightly above the maturing temperature of refractory clays. This type of ware can generally be cooled rapidly without danger and is likely to show a better color for so doing.

The production of flashed browns from this type of clay is readily accomplished by periods of reduction followed by reoxidation. The degree and number of reducing periods must be determined by trial to produce the amount of flashing desired.

The clays containing both iron and lime, from which good, light-colored ware is often produced, demand quite a different course of treatment. Heated in a clean oxidizing atmosphere these clays show, according to Dr. Seger, a dirty red to yellowish brown color. With sulphurous gases present in the oxidizing atmosphere the lime greedily takes up the sulphur, leaving its silicates and forming $CaSO_4$, which leaves the iron in the form of ferric compounds and sulphides which impart a red or reddish brown color to the ware. This color, however, is not dependable and may show itself only in spots with other portions showing green or yellow. In strongly reducing gases, the sulphates and sulphides break down, permitting the lime to combine with iron in the form of silicates. These are of the ferrous order and impart a dark color which, on reoxidizing, become ferric and lose their coloring qualities, leaving the ware lighter in color than before and of a more even shade. A succession of reducing periods is necessary to produce good color, but they need only be maintained during the latter part of the burn, as these reactions take place only at high temperatures just before vitrification or pore closing sets in. The danger of over-burning this type of clays is great, as lime and iron silicates fuse with a very slight increase in temperature after vitrification occurs. It is therefore unsafe to carry their maturity to the point of pore closing.

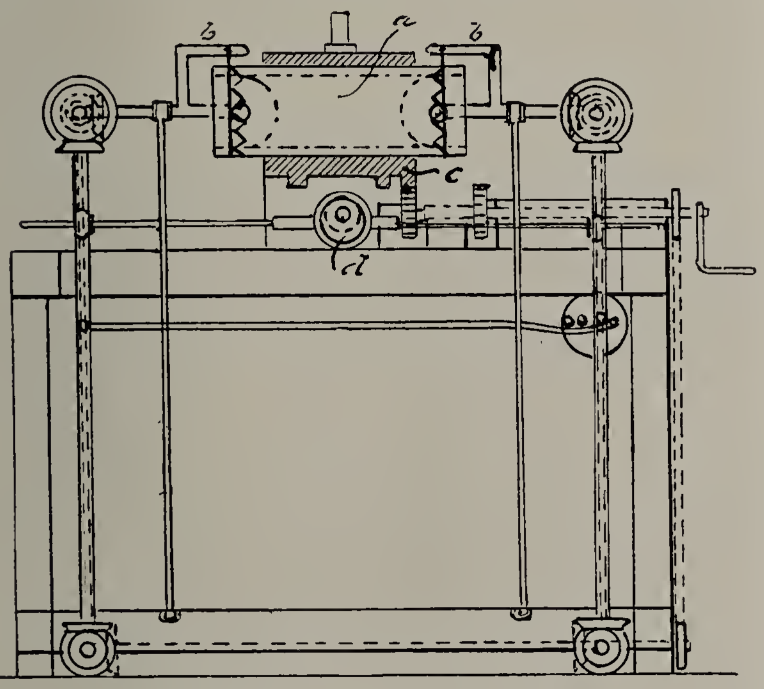
(Continued on page 94.)

FOREIGN SCRAPINGS

German Patent for American Inventor. William Drayton, of Shawnee, Ohio, has been granted German Patent No. 284,338 on a continuous tunnel kiln in which the product to be burned is moved on cars.—Deut. Topf & Z. Z. No. 86, 1915.

Exposition in London. In place of the expositions which are usually held in Leipzig, the English exporters will hold an exposition in London, March 14-24, 1916, to which everybody will have free access with the exceptions of German, Austrian, Hungarian and Turkish merchants.—Keramische Rundschau No. 40, 1915.

Interlocking Joints for Drain Tile. As most of the cutting apparatus for drain tile leaves an uneven surface on the inside, Mr. J. K. Jensen, in Klutzow in Posen, has obtained a patent for a machine which will cut drain tile in such a way that they will interlock and have a perfect smooth etch on the surface of the inside. A is the drain tile to be cut, B is the cutting arm which turns around, C is the platten which moves backwards and forwards to give the tile the interlocking features. D is the eccentric arrangement by which the platen is moved backward and forward.—Deut. Topf No. 86, 1915.



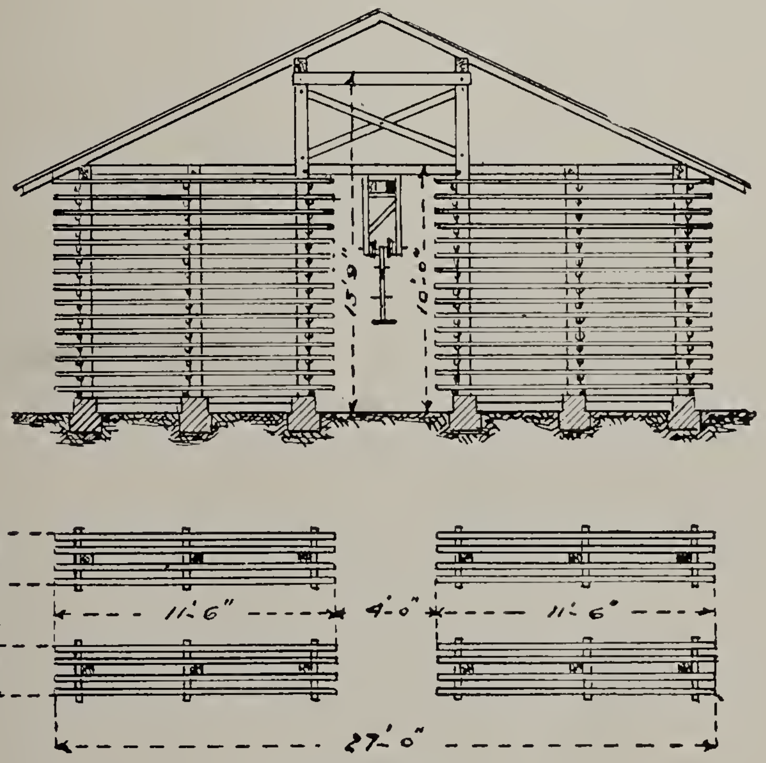
Interlocking Cutting Machine.

Drying Loss in Clay Products. The drying loss in all clay products can easily be overcome if the raw clay has been properly prepared. All such clays must be ground in a dry pan and properly screened, for it is only the uneven texture of the clay mixtures which will start the loss in drying. The screen will take out all large particles and return same to the grinding machine, and when the fine ground clay is mixed with water and made into proper consistency for the forming of the different clay products, the drying problems will be far less difficult than before.—Ton Ind. Z. No. 122, 1915.

Demand for Brick in East Prussia. A German government commission has reported that the Russian soldiers destroyed in East Prussia 24 towns, 600 villages and 300 farming communities, containing more than 33,500 large buildings and over 100,000 residences. Inasmuch as most of these buildings will be rebuilt with brick, it will take, according to estimates, 670,000,000 brick to replace the buildings which were destroyed. Figuring that the average German brickyard has a capacity of 3,000,000 brick per year, it will take 225 brickyards to supply this demand. As this is more or less an impossibility for the East Prussian countries, it is now proposed that the government ship brick from all parts of Germany free of charge to East Prussia, and thereby assist and cheapen the rebuilding of that state.—Duet. Topf & Z. Z. No. 79, 1915.

Swedish Clayworkers' Convention. The Swedish clayworkers held a convention in Stockholm on November 12, last, and some forty members were present. Secretary G. W. Cronquist made his report and resigned his position, to take effect on January 1, 1915. Prof. H. Krueger read a very interesting paper on the load carrying qualities of clay products, and experiments made had proven that only 20 per cent of the clay products did not come up to specifications. After the convention the next day, all members visited different clayworking plants and buildings in and around Stockholm.—Tegel No. 11, 1915.

Open Air Dry Shed for Brick. It is always a question as to what kind of open air drying shed costs the least to install, and Engineer C. Fleshut has devised a system of sheds, which are very cheap to construct. In the center aisle he has installed a traveling rope device for the boards loaded with green brick, and this system makes the handling very cheap. He uses fifteen slats in the height, and the distance between them is 6¼ inches. The location should be such that the prevailing summer winds will strike the drying sheds lengthwise. If the prevailing wind is from the west, then the shed should be built north and south. There should be left between each section at least 20 feet space, so that the air can properly circulate. The cut shown will give a good idea of the general arrangement.—Tonind Z. No. 119, 1915.



Drying Sheds.

Silica Brick Manufacturing—In the making of silica brick it is always profitable to use some lime. This lime should always be freshly prepared, and it is best to use the slacked lime, so that the mixture is still warm. This will add in setting the brick. It has been found that brick made with old slacked lime will take weeks before they are hardened enough to be handled, while brick made with new fresh slacked lime will be ready to be handled in a short time.—Ton Ind. Z. No. 44, 1915.

CLAY PRODUCTS AS AN ENGINEERING MATERIAL.*

By A. V. Bleininger, Bureau of Standards, U. S. Dept. of Commerce, Pittsburgh, Pa., U. S. A.

(Continued from December Issue.)

3. Brick Pipes.

(a) Howard's Work.

The subject of brick piers has been given considerable attention in this country by Mr. J. E. Howard, at the Watertown Arsenal, and it was shown by him at an early stage of the work that the kind of mortar was an exceedingly important factor. The inherent great strength of brick can only be utilized by using a strong mortar. In ordinary brick masonry, therefore, even a fairly low-grade brick will possess ample strength. In places where strength is a real desideratum, cement or cement-lime mortar can be the only bonding material to be considered. Thus, Howard found columns, built of hard brick and from 6 to 10 feet high, to show, with 1:3 lime mortar, a modulus of elasticity from 250,000 to 750,000 and an ultimate strength of from 750 to 1,300 pounds per square inch. The piers were invariably found to split longitudinally, indicating that the tensile strength of brick is a very significant quality and that, hence, the transverse test is an important factor. Using Portland cement mortar (1:2) the modulus of elasticity of the pier was raised to 3,000,000 and the ultimate strength to 2,500 pounds per square inch. Howard, at the Pittsburgh laboratory of the Bureau of Standards, also conducted tests of two very large brick columns, 4 feet square and 12 feet high, built with hard common brick from the Pittsburgh district. One was laid in 1:1 cement, the other in 1:3 lime mortar. The first showed an ultimate strength of 2,917 pounds; the second 757 pounds per square inch. The total compression of the lime-mortar pier was chiefly permanent set, while the cement-mortar column at 1,000 pounds load was one-third permanent set and two-thirds elastic compression.

(b) Recent Tests of Bureau of Standards.

A considerable number of brick piers have recently been tested, at the Pittsburgh laboratory, by J. H. Griffith and J. G. Bragg,* in co-operation with the National Brick Manufacturers' Association. The size of the piers was about 30x30 inches, the height being 10 feet. Three kinds of brick were used: Vitrified, hard and soft. Three kinds of mortars were, likewise, employed—cement-sand (1:3), 85 per cent. cement, 15 per cent. hydrated lime to 3 of sand and lime mortar (1:6). Variations in bond were likewise made, viz., headers every other course, a header every fourth and every seventh course. All joints were made squeeze joints. The average thickness of the joints was 5/16 inch. The results of these tests are compiled in Table IV.

Table IV.

Kind of Brick	Kind of Mortar	Age	Bond	Maximum Load	Load in Lbs. per sq. in.
Soft (C)	Lime	4 mos.	1:1:5	129,000	126
Hard (B)	Lime	4 mos.	1:1:5	892,000	990
Vitrified (A)	Lime	4 mos.	1:1:5	1,280,000	1,360
Soft (C)	Lime	4 mos.	1:1:2	182,000	178
Hard (B)	Lime	4 mos.	1:1:2	804,000	890
Vitrified (A)	Lime	4 mos.	1:1:2	1,197,500	1,270
Soft (C)	Lime	4 mos.	1:0:1	215,000	210
Hard (B)	Lime	4 mos.	1:0:1	764,000	840
Vitrified (A)	Lime	4 mos.	1:0:1	1,360,000	1,450
Hard (B)	Cement-Lime	1 mo.	1:1:5	1,545,800	1,760
Hard (B)	Cement-Lime	1 mo.	1:1:2	838,000	870
Hard (B)	Cement-Lime	1 mo.	1:0:1	1,594,000	1,760
Vitrified (A)	Cement-Lime	1 mo.	1:0:1	2,695,000	2,900
Soft (C)	Cement	1 mo.	1:1:5	660,000	650
Hard (B)	Cement	1 mo.	1:1:5	824,000	870
Vitrified (A)	Cement	1 mo.	1:1:5	2,697,000	2,900
Soft (C)	Cement	1 mo.	1:1:2	580,000	560
Hard (B)	Cement	1 mo.	1:1:2	1,834,000	2,070
Vitrified (A)	Cement	1 mo.	1:1:2	2,550,000	2,740
Soft (C)	Cement	1 mo.	1:0:1	524,000	510
Hard (B)	Cement	1 mo.	1:0:1	1,714,000	2,000
Vitrified (A)	Cement	1 mo.	1:0:1	2,520,000	2,710

Typical stress-strain curves of these piers are shown in the diagram of Fig. 4.

(c) Conclusions from Pittsburgh Tests.

From this work the authors draw the following conclusions: "The low strength of the lime mortars is attributed, in the main to insufficient aging with a consequent lack of proper carbonation. The piers laid up with cement and cement lime mortar have about the same strength for any one grade of brick. The relative strength of piers built with vitrified, hard and soft brick laid in cement mortar is approximately in the ratio of 5:3:1. The work so far indicates that the strength of the pier is largely independent of the course bonding, the real function of the bond being, it is believed, to maintain a certain integrity and monolithic action of the masonry against initial strains induced through setting and drying out of the mortar. The slight increase of strength with the increase in distance between header courses is thought to be inconclusive. The mean moduli of the vitrified and hard brick laid in cement mortar were 3,000,000 and 2,500,000, respectively, the correponding figures for piers in the lime and cement mortar being somewhat lower. The elastic limit is approximately one-half the maximum load.

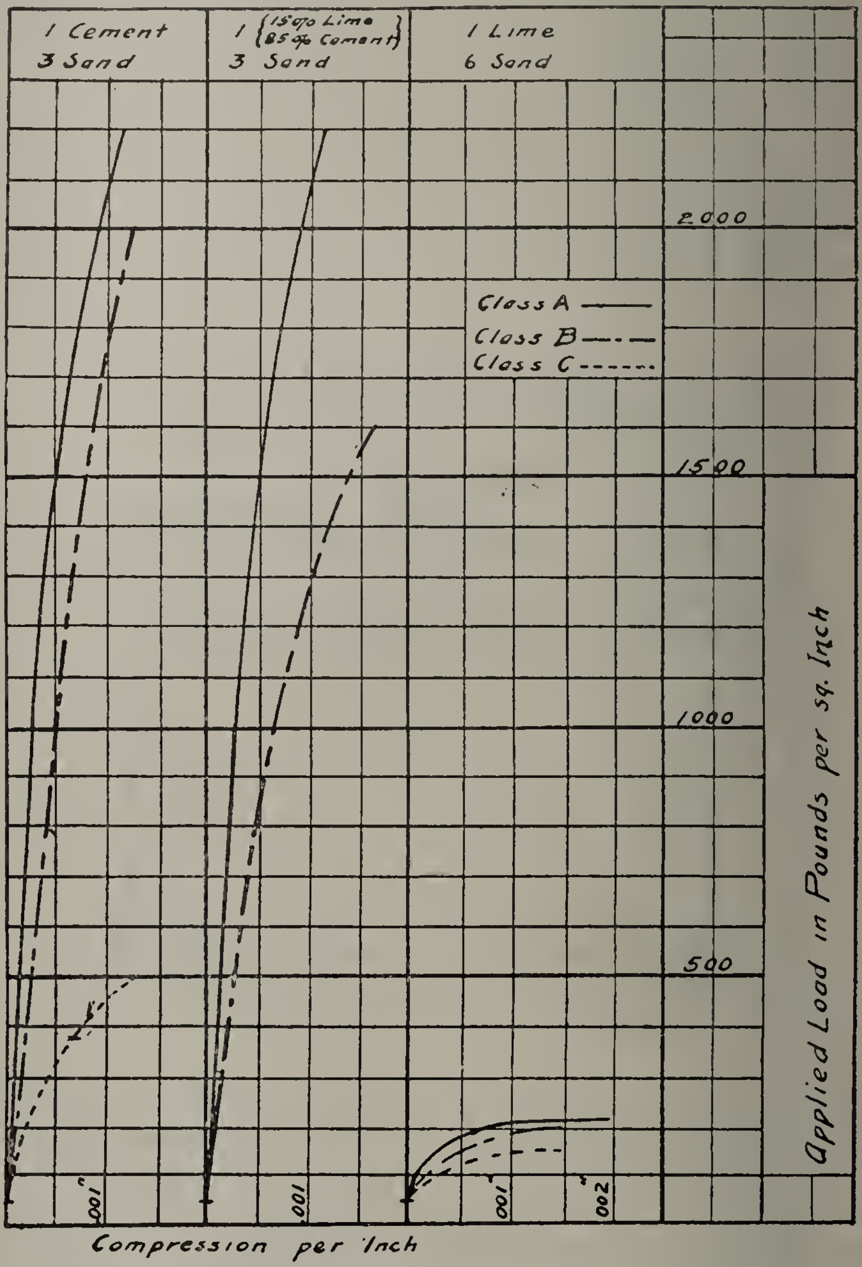


Fig. 4. Stress-Strain Curves of Tests on Brick Piers.

"The piers fail through a tendency to separate into vertical laminae caused by transverse failure in the individual brick occurring from flexual action produced through unequal distribution of the vertical load over a cross section together with ineffective shearing and adhesive strength of the mortar. Uniformity in the brick dimensions is also a factor, to a lesser extent, in reducing unequal compression in the joints, as is the thickness of the joint itself.

"A high modulus of rupture is more desirable than superior crushing strength, as far as these be differentiated in their inter-relations. A higher modulus of rupture would be realized in practice either by increasing the thickness of the brick or by laying them on edge so as to give their greatest flexual efficiency.

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* A paper presented at the International Engineering Congress. San Francisco, Cal., September 20-25, 1915. By permission Director Bureau of Standards.

*The Clay-Worker, March, 1915.

4. Porosity and Resistance to Weathering.

Undoubtedly the most important quality of exposed structural stone products is their resistance to the weathering agencies, of which freezing and thawing are the most destructive. The properties which make certain materials weather resisting, while others succumb after a short or longer time, are not clearly understood. It is known, of course, that a vitrified brick, showing but little absorption, endures well, but when we are dealing with porous materials, the fact stands out that the one most absorbent, showing the greatest porosity, is not always the least resistant. Thus, porous brick made by the soft-mud process may be decidedly superior in this respect to less porous brick made by the stiff-mud process. It is evident that not only the volume of the pore space, but the mean diameter of the pores and their intercommunication are important factors. Brick covered with an impervious coating, like a glaze or enamel, are subject to more severe stresses due to freezing and thawing than the same grade of material not so treated.

The only means of testing structural stone products as to their resistance to atmospheric agencies has been the freezing test. This test, while probably the best means of judging durability, is laborious and expensive, owing to the many repetitions. Other more indirect means of examination have been suggested, as, for instance, the testing of specimens in the wet and dry state. Any decided lowering of the strength due to the saturation with water is supposed to be an index of the weather resistance.

Accelerated tests have also been suggested as a substitute for the freezing test by making use of the volume change due to the crystallization of salts within the pores of the material. The most important method is Brard's process,[*] consisting in immersing the specimens in a boiling solution of sodium sulphate, Na_2SO_4. 10 H_2O, Glauber's salt, and exposing them to the air for a day in order that the salt may crystallize. This process is repeated. The solution of the decahydrate should be saturated when cold or at a temperature below 80° F. The loss in weight due to spalling may be computed. The average loss in weight by the sodium sulphate test is about six times that by the freezing test.[*] This test has also been used quite extensively by Prof. Bauschinger at the testing laboratory of the Royal Polytechnic School, Munich. This test was applied, in the Bureau of Standards laboratory at Pittsburgh, to three typical clays burned, in the shape of test pieces 4x4x2¾ inches, to different temperatures and subjected to four immersions (for 24 hours) in saturated sodium sulphate solution, followed each time by immediately drying at 110° C. Two series of specimens were prepared, one of which was fired to a somewhat higher kiln temperature than the other. The results were the same in each case and are compiled in Table V. From these data it will be observed that the test is sharp and decisive in breaking down the structure which has not reached its full strength. However, compared with the freezing test, it undoubtedly is too severe. It might be possible to modify it by using a lower concentration, say, a 10 per cent. solution of sodium sulphate.

Elaborate procedures, as outlined by Hirschwald,[†] for the study of the weathering quality of stone are not readily applicable to clay products.

The remarkable resistance of well-made clay brick to destruction by weathering is amply illustrated by the mediaeval brick architecture of Central Europe, not to mention the brick architecture of Babylonia and Assyria.

5. Resistance to Sudden Heating and Cooling.

In the large problem of fire protection, the resistance to sudden heating and cooling is an important factor. It is to be expected that clay products should stand up well under these conditions, having already gone through the ordeal of fire in their manufacture and, hence, containing no volatile constituents. Their resistance to such conditions must be considered a function of their porosity. The more porous the brick, the better they should withstand sudden temperature changes. A certain degree of homogeneity, absence of large lumps of foreign material, is also a necessary condition.

In large panel tests made at the Underwriters' Laboratories and reported by Mr. Richard L. Humphrey[*] it was found that brick withstood the tests better than any other material. Lime knots seemed to be responsible for damage done to the brick. Dense vitrified brick probably do not stand up so well under severe conditions as the more porous brick. Comparison with natural stones, in these fire tests, showed that brick were superior to them. There is undoubtedly need for further work along these lines.

Actual fire experience seems to give undoubted proof of the excellent fire resisting qualities of clay brick.

With reference to clay building brick as a structural material, it might be said that they undoubtedly afford one of the very safest products available, as usually their strength is ample for the purposes required and any inferior quality is at once detected by the most inexpert by simple inspection. Brick have stood the test of time and are not likely to lose their importance as a building material in the future.

6. Paving Brick.

The extensive use of vitrified brick for the paving of streets and roads has led to the adoption of rigid requirements for this class of materials. The test used for this purpose is the so-called rattler test, a standardized tumbling barrel in which ten blocks are subjected to abrasion, both from each other and from cast-iron spheres, the standing of the samples depending upon the loss in weight suffered after one hour's run (1,800 revolutions). After considerable experimental work on the part of the National Paving Brick Manufacturers' Association and Prof. Edw. Orton, of the Ohio State University, standard specifications for the rattler and for the procedure of the test have been recommended.

TABLE V.

	Burning Temp.	Absorption %	Absorption % (check	Remarks
Surface clay	900	21.7	19.4	Cracked badly on first treatment.
Surface clay	950	21.2	19.4	Failed on second treatment.
Surface clay	1000	21.2	18.0	Cracks became prominent on second treatment.
Surface clay	1050	19.1	14.8	Failed on third.
Surface clay	1100	6.3	1.3	Not affected.
Surface clay	1150	0.6		Overburned. Not affected.
Shale	900	19.6	17.7	Many fine cracks after first treatment.
Shale	950	18.4	17.3	Failed on second treatment.
Shale	1000	14.2	12.0	Cracks increasing through first three treatments; failed on fourth.
Shale	1050	9.3	8.1	Not affected.
Shale	1100	2.8	3.0	Not affected.
Shale	1150	2.3	0.4	Not affected.
Shale	1200	2.7	1.3	Not affected.
No. 2 fire clay	900	15.8	15.3	Edges chipped after first treatment; failed on second.
No. 2 fire clay	950	15.0	15.1	Edges chipped after second treatment.
No. 2 fire clay	1000	13.5	11.6	Failed on third.
No. 2 fire clay	1050	10.5	9.6	Cracked badly on fourth treatment.
No. 2 fire clay	1100	8.2	8.3	Not affected.
No. 2 fire clay	1150	5.8	5.8	Not affected.
No. 2 fire clay	1200	3.5	3.0	Not affected.

The following scale of average loss has been suggested for different requirements.

For brick suitable for heavy traffic.........	22	24
For medium traffic	24	26
For light traffic	26	28

Owing to the severity of this test, the absorption and other factors are no longer taken into account for paving brick.

In the use of paving brick, the proper laying of the blocks is of paramount importance. Unless a good concrete foundation is prepared, the sand cushion applied and rolled uniformly, the grouting thoroughly done and proper longitudinal expansion joints allowed, even the very best blocks will not result in a pavement of the highest type. It is for this reason that explicit specifications have been worked out by the National Paving Brick Manufacturers' Association with great care and persistently advocated. Given proper conditions of laying, brick streets of magnificent wearing quality will be obtained, such as has been realized in the many miles of brick-paved streets in Cleveland, Ohio, and other cities.

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[*] An. de Chem. et de Phys. Vol. 38, p. 160 (1828), later modified by d'Hericart and de Thury. Trans. Am. Soc. C. E., Vol. 33, p. 246.

[*] Trans. Am. Soc. C. E., Vol. 33, p. 253.

[†] Die Pruefung der natuerlichen Bausteine auf ihre Watterbestaendigkeit, Berlin, 1908.

[*] U. S. Geological Survey, Bull. 370.

[*] Proc. Am. Soc. for Testing Materials, 23, p. 289.

Note: The remainder of the bulletin was devoted to hollow building tile and fireproofing, architectural terra cotta, sewer pipe and drain tile, refractories, floor tile, wall tiles, roofing tiles, enameled brick and sanitary ware. You can secure this bulletin from the Bureau of Standards, U. S. Department of Commerce, Pittsburg, Pa.

BUTTON-HOLE TALKS.

HOW I WENT DOWN INTO THE CANYON.

RESTING luxuriously in the Limited, outside a level plain, with distant mesa and warm sunshine over it all, I live over again the thrills of yesterday and hasten to put them on paper before they fade.

At Los Angeles I had stood in line, a long, wearisome line, awaiting assignment of my sleeper accommodations. Slowly and sadly each of those before me told their tale of woes and received elaborate and varied instructions from the patient clerk in attendance. A little man, under the personal guidance of a grim-visaged, angular and determined looking wife, held long converse regarding their route and as to which of two they would take in view of a difference of a dollar and a half. Had my time been of any value and had I been free from financial cares, I would have paid it myself and thus ended the discussion, but remembering how big a part of my salary it represented, I desisted. Dropping from a demand for a certain train, on a fixed day, and coming quickly to a position of anything and any time, I secured the little tickets that mean dividends to the Pullman Company on the one hand and a chance for rest and relaxation on the other. I knew it was a sort of lottery ticket, and such it proved. A human, female phonograph, that needed no winding, occupied the section opposite physically, but vocally she occupied that whole end of the car. How a woman could talk so long without breathing was a constant wonder to me, as I sat waiting to see her suffocate. Finally, after some hours, I heard her say, "I began telling about this trip last spring." Then I resigned myself, knowing that if she had been talking thus, without breathing, for some eight months, she had solved the problem of life without breath. All the tickets in the car were lecture tickets, and not sleeper tickets, that night. Yesterday they transferred her to another car, and the sigh of relief that emanated from the other passengers blew the door open. But she came back, blockaded the ladies' washroom, and then picked a new listener and went to it again, while the "mere man" owner of the berth she was holding went into the washroom and tore his hair.

However, to get quickly to my subject. Arriving early in the morning, and having but the one day, I hurried into El Trovar and breakfasted, then I took the few steps in front and stood at the wall, on the brink of the abyss. I would like to describe the scene and its effect, but it is beyond my power. So many abler men, with better vocabularies, have tried and failed. I quote from a nameless one who wrote for the railroad company. He needed the pay and he had the adjectives with him, and he used them, throwing in participles just to show his liberality. I only quote a brief extract as a sample, but he could do it by the page:

"An inferno, swathed in soft celestial fires; a whole chaotic underworld, just emptied of primeval floods and waiting for a new creative word; eluding all sense of perspective or dimension, outstretching the faculty of measurement, overlapping the confines of definite apprehension; a boding, terrible thing, unflinchingly real, yet spectral as a dream."

Noting that they were already forming a party to go down, I hurriedly went down, on foot, and explored the upper end of "Bright Angel Trail." Just a little of it satisfied me. I at once amended my program. I recalled that in the old wartime many a man, full of patriotism, but deficient in nerve, had solved his problem by sending a substitute to the front to catch his bullets. In all the accounts I had read of the people who had gone down, none of them had thought of this, so I said, quietly to myself, this scheme is my own—I will send a substitute. As I came up the guide was busy apportioning the donkeys, so, unshaken by the change of costume of the ladies as they prepared to ride astride, I hastened to catch on to what was doing. The guide asked each in turn how much they weighed and then selected an animal for that burden. Just as I came up he addressed a mature matron who appeared to have been melted and poured into her costume, filling it to the limit and filling you with apprehension that the buttons might give way and spill her all out. He asked her weight. Blushingly she answered, "A hundred and forty-odd." The nearest mule shied, staggered to the edge and looked over. All the mules winked at each other, seeming to say, "Odd, indeed, isn't it?" The guide said nothing, but picked his biggest mule, and the mule kicked him and groaned. Looking hurriedly about, I selected a thin, hungry-looking man, who looked as though he had a long past and a short future, one who looked to me that he could repent rapidly and promise and pray fervently; one who appeared capable of suffering and then forgetting; one whose anatomy was so arranged that when I looked down at him, through the telescope, I could see when his heart went into his mouth. As usual, I was acting economically, so it was not necessary that he know that he was acting as my substitute. He could just as well do this unconsciously. He was paying his own way. True it is that in the war-time they paid their substitutes, but these are times of retrenchment and we must economize. He could act for me just as well while I stayed at the top and spent my money there. When I saw the mule they gave him, I was more than ever glad I had decided on this substitute idea. Nor did *he* wear any glad smile as he peered out between the ears of his mule, that animal that now meant life or death to him, and that, too, not of his own selection, but one that had been wished on him. Seated on a rock whose stability I had investigated, I looked down upon the cavalcade. I saw my substitute clutch his saddle as his mule—our mule, rather—skidded on a steep zigzag. I saw his Adam's apple jump as his heart came up and hit it, and I could almost hear his heart beat as it struggled in its confined quarters. So I sent him a wireless-spirit message to hold to it, no matter how many buttons rained on him from above. It was Sunday, and, as the cavalcade got lower down, where the chasms were deeper on the one side and the loose, overhanging rock higher on the other, the valley was filled with prayer. One could sense it from above. Those who were used to it prayed fluently and those who had not prayed for years now reverted to their "Now I lay me" with a fervor that was wonderful. All over the country people in the churches were praying, but doing it listlessly, with wandering thoughts. This chasm was now, however, a prayer center where prayer was fervent and where it was coupled with earnest promise of better lives in the future, if life was now spared. Later on I watched the party winding along, miles below, like a procession of ants crawling along an ant path.

Last night, at sunset, while the glory of gold and red in the west was fading into violet and purple and blue, I sat on the brink of the canyon and looked out over its thirteen miles of dimming color. A mile down the shadows had dimmed it; the deepened shadow of the canyon at the farther side still showed dimly, but all detail was blotted out. None of its beauty was lost, for it just faded gradually as if a succession of filmy veils were, one after another, interposed. The splendid colors faded, but were all the more beautiful and entrancing. The shadows grew, and as they grew they became more mysterious, more beautiful, more entrancing. More and more it dimmed, and, as it dimmed, it more and more entranced. As the far distance was obscured it seemed that the middle distance was brought nearer. Then that, too, was lost, and only the foreground was left. I sat entranced until all was black, when, filled with exalted thought, I turned to the hotel only to meet the Human Phonograph and hear her say, "I told him I wanted Caper Sauce with the Lamb and to bring more Pickles"—and I ducked. GATES.

THE PRESENT WAR SITUATION OF THE CLAY-WORKING INDUSTRIES IN GERMANY.

THE TONINDUSTRIE ZEITUNG prints the following report on the situation among the clayworking industries of Germany, which has been prepared by Mr. Max Roessler, a very prominent clay manufacturer, and which was made at the request of the German Imperial Bank. The report deals with clayworking industries in general and the fine ceramic industry in particular, and covers the period from the start of the present war until September, 1915.

"The clayworking industry belongs to those manufacturing branches which were especially hard hit immediately after the starting of the war. A great part of the coarse ceramic trades (brick, roofing tiles and sewer pipes) are dependent on the building trade. This is also true to some extent of the fire brick and stoneware products in so far as these manufacturers do not make any products for the furnaces of the iron industry, chemical and ammunition factories, which are now being operated to their highest production period.

"Of the actual tile products large stock was on hand in heating stoves, furnace tiles and similar products. In floor and wall tiles a strong decline was caused by the inactivity of the building trades. The German fine ceramic industry (porcelain, whiteware, fine and art stoneware and majolica) exported at least one-third of the entire production to foreign countries before the war. The principal markets with the countries with which we are now at war, England and its colonies, Belgium, France and Russia were closed at once for us, and later on through transportation difficulties also the neutral contries such as the United States, Central and South America, Spain and still later on Italy, were all closed for our markets. Through the failure of the tourist trade in Switzerland, the demand was far less than usual and only with the Scandinavian countries and the Netherlands are we now doing an undisturbed business. The export of such products to Austria-Hungary was never very important, and at present it is of no consequence.

"A very important part of the fine ceramic products consists of luxus articles of every description for flower decorations, toys and articles with metal inlay. In all these luxus articles the home demand is also very much lower, and this is now also the case with articles used direct in every day life. Immediately after the declaration of war all private freight transportation stopped for a considerable period with the results that many factories had to stop operations entirely. The Christmas trade brought some increase. Since New Year's many of the factories have started up again in their regular daily operations but with decreased number of employees and in many localities also with shorter working hours. Only those factories which are manufacturing technical specialties are busy, while those that are making electrical goods are very busy at present. The German merchants in fine ceramic ware have kept their own very well in these war times, which can be attributed especially to the existing trade combinations. The demand for government control was only exercised in very few cases and this in addition with the longer credits granted by the factories themselves, will enable many firms to tide themselves over and prevent failures.

"Heretofore the women played only the part of purchaser of these different ceramic products for private and household use, but now through the absence of many merchants doing military services, the wife must continue the business and in this occupation she has proven a strong assistant in the fight for existence. It may be that the stock which the merchants had on hand was entirely gone, or that the German success of the war has influenced and created a better general feeling, or it must be the proof of the sound and systematic income and property conditions of all the German people, the fact, however, remains that the exposition which was held this fall in Leipzig was visited by a great number of German merchants and it was rather remarkable to the extent of which they all bought different goods, especially since the results of the two former expositions since the war, one in the fall of 1914 and the other in the spring of 1915, were not altogether very promising. While the total production of the clayworking industries decreased two-thirds in its regular production since the commencement of the war, it is quite possible that it will increase materially again very shortly.

"On account of the war about two-thirds of the trained male employes of the clayworking industries are at present doing war services, with the remaining one-third and with the assistance of female employes operations are continued in spite of all difficulties. Some factories have stopped, however, and some are in financial difficulties, and when we can get a clear view of the situation after the war is over, quite a few more factories will be sacrificed and will have to give themselves up in this gigantic commercial struggle. All factories have started to use the accumulated profits of former better years, part operating without any profits, while others are working at a loss. Production is made very much more difficult partly through the shortage of trained employes, but also through higher prices and shortage of raw materials and supplies, further increase in wages and same overhead expenses as before. It is one of the characteristics of this trade that the greatest part of the cost of production of clay products is the wages paid employes and that the capital investment of the factories is very high in comparison to the possible yearly production. This is one of the reasons that the decrease in sales plays such an important part and requires such a great sacrifice in keeping factories in good condition.

"The working population in the country are making many offerings in strength, health and blood, but the city workers suffer less, especially those who have been busy making war ammunitions. The wages have not been reduced, but have been generally increased. Those who could not find work through the closing of the factories in the first months of the war at their old trade, found employment in making war ammunitions. In Thuringia and Bavaria, where we find, although not the largest, but the greatest number of factories, most of the old employees made and are still making war shells. The working men who remained behind at home, and the family of those parties who went to war do not suffer so much through the shortage of remunerative employment as through the increased cost of living with which no increase in wages can keep pace.

"Those countries with whom we are at war, are making great strides and especially with the German industry of fine ceramic products to exclude us entirely from the world trade. We should not worry, however, over the future. It is impossible for our enemies to gain in a short time the German enterprise, thoroughness, adaptability, expertness and efficiency, nor is it possible for them to obtain the same education, observation and knowledge, further the dexterity, the creative force and the dependable service with which we have conquerred so far a place in the markets of the world. Furthermore it will be a mistake to count at once on an increase as soon as the war is over. It will take a long time to re-establish our connections with foreign countries, partly through the difference in nationalities, partly through lower purchasing power and partly also through higher import duties which will be established in some countries as a protection against German importations.

"In our own factory we find many changes. Ten per cent. of our trusted employes are buried in the war zones, and another part are made permanent invalids.

"When our men return from the war, they will be full of loyalty to the German Empire but they will have new ideas and a better understanding of the workings of the government, and although they have been moulded by this war training to experienced and proven manhood, they will be more outspoken and less to be guided than before. Every employer, who formerly acted without regard to the benefit and demand of his employes, will have to change his methods hereafter. The working class will demand more respect and association and they will demand more returns for their labors, and it will be well if employer would share some of his profits with them.

Delivering Wire-Cut-Lug Brick on the Job.

"The end of the present war will not open a paradise for the clayworking industries but will give us a responsibility of heavy and sacrificing work for which we will ultimately earn those profits which are due us. In spite of the very poor conditions in which our clayworking industry in company with other industries is placed at present, we will and must try to elevate some again to victorious issues, where we can apply and feel ourselves capable of profiting by the experience of this war."

From present indications about the only thing that can put a block in the way of the prosperity wagon this year will be a series of great strikes, and here's hoping we can manage to reduce the annual crop of labor troubles.

Written for THE CLAY-WORKER.

BRICK ROADS IN ST. LOUIS COUNTY, MISSOURI.

An Object Lesson in the Value and Importance of Permanent Highways.

WHAT IS PROBABLY the first brick road laid in Missouri, outside the limits of the large cities, has just been finished in St. Louis county. It is a sample road being laid by the Hydraulic Press Brick Company, of St. Louis, with their vitrified wire-cut-lug paving blocks, under a guarantee as to its lasting qualities, smoothness, cost, etc. The work was done under the direct supervision of Messrs. Blackburn and Schmidt, the well-known paving experts and road engineers associated with the Dunn Wire-Cut-Lug Brick Company.

The county officials have been experimenting with other kinds of paving materials, such as concrete, bitulithic macadam, ordinary macadam, granulithic, etc., without very satisfactory results. While most of them are very good first laid, they soon wear out or blister or peel, causing holes and ruts, so in a comparatively short time they have to be remade or resurfaced, which raises the maintenance cost to a high figure. This maintenance cost is what in the main prompted the county authorities to accept the offer of the Hydraulic Press Brick Company to lay a trial brick road. It was agreed between the county and the company that the stretch of model brick-paved road was to be paid for later by the county if it proves to be as represented—a permanent, dependable, smooth road, with negligible maintenance costs.

Starting a Section of the Model Brick Highway.

G. A. Bass, president of the Hydraulic Press Brick Company, asked the county officials to select a stretch of road that bore the greatest amount of traffic, in order to insure the severest test. The authorities decided on the intersection of the North and South with the Clayton road. The North and South road is the main artery leading into Clayton, the county seat of St. Louis county, while the Clayton road is probably the most heavily trafficked artery from the city into the country.

In order to get a comprehensive idea of what the road would cost, detailed records were made of everything that entered into the cost of construction, so the authorities could have the data at their disposal for comparison. Two different methods of construction (both of the monolithic type) were used. In the first the old road bed, which was 12 to 18 inches thick with riprap and macadam, was graded to correspond to the finished surface of the pavement, and the slight depressions were leveled with a 2-inch cushion of 1 to 4 cement and sand mix. The brick were then laid on this base and thoroughly grouted. This method not only grounds the whole mass of brick into one solid unit, but binds the brick surface to the base, resulting in what is practically a monolithic construction.

In the second method, which is strictly known as monolithic, 4 inches of concrete was laid on the sub-grade, which, in this particular instance, was the old roadbed worked to the proper level. Then over the green concrete was spread a ½ to ¾-inch cushion of 1 to 4 cement-sand mix, on which the brick were set. A filler, 1 to 1 cement-sand, was at once applied and thoroughly worked in.

This method is to be recommended where the road is being put through virgin soil or clay, as the concrete base is necessary to hold up the brick. When, however, an old rock road is to be surfaced with brick, the first method described is just as satisfactory, will give just as good results and is considerably cheaper. Of course, the depth and consideration of the old foundation must be taken into consideration, as this will largely govern the ultimate success of this method. If there is room for any doubt, the concrete foundation should be put in.

It is estimated that the first method of construction will cost approximately $1.30, as against $1.70 per square yard for the road made according to the second method. Both figures are exclusive of grading, which, of course, is an expense common to all kinds of paving. It must be borne in mind that in a brick street or road properly constructed of well-burned brick, the first cost is practically the only cost. While in the case of various other kinds of paving the first cost is greatly increased in time by constant expenditures for maintenance.

A Section of the Brick Pavement.

There is now a well-defined movement on foot among the residents of St. Louis county to hold an election and vote on a $3,000,000 bond issue, the proceeds to be devoted to the hard surfacing of the county roads, and the consensus of opinion among the better informed residents is that it will go through easily. The writer has talked with several of the larger property holders and a majority of them are in favor of brick.

Generally speaking, the brick manufacturers have done more to hurt their business than all other causes put together by not always furnishing the best quality of brick, and following up their service by insisting that the work be done according to the best methods.

Vitrified brick, when properly made and properly laid, are in a class by themselves as a permanent paving material. but, when poorly made and laid, are a standing rebuke to the shortsightedness of both the brick manufacturer and the engineer. It should be up to the manufacturer to see that nothing but good material leaves his plant, and after it gets on the job to see that it is properly laid. Many a street laid with good brick has gone to the bad because of a bad foundation, poor cement, or a dozen other reasons, and it is strictly up to the manufacturer to see to it that his brick are given a square deal by the contractor, as this is just as much his business as it is to see that nothing but good brick get into the car.

The action of the Dunn Company in licensing only those manufacturers who can show a continued production of a uniform No. 1 paver is commendable indeed, and it should be carried out on even stricter lines by having visiting engineers in the employ of the Dunn Company get out among the highway engineers and see that only the best product is furnished. An effort should also be made to have the Society of Municipal and Highway Engineers pass only brick made by the accredited members of the N. P. B. M. A. and to have membership in that organization restricted to those only who can show that they are able to and do make good pavers. This will protect the manufacturer of good paving brick, and will force the fellow who is hurting the trade at large, by his inferior product, to engage in the manufacture of some other line of stuff. There was a time not far back when the idea prevailed among the clayworking fraternity that any clay or shale that would vitrify would make a good paver. This idea, however, has been pretty well exploded, much to the good of the trade, and to the sorrow of the fellow who went into the business with that idea in his head.

A Portion of the Finished Pavement.

This country is now passing through a period of agitation on the subject of hard surfaced roads, and during the next five years it will be pretty well known by road experts just what is the best road material, and it will depend on the character of brick furnished by the brick manufacturers as to the future of the paving brick industry. Undoubtedly if a first-class product is put into the roads, with proper construction, brick will be universally adopted as the future paving material.

The motor truck is forcing counties and states to do what the pleasure car has forced the cities to do—pave their roads—and it will only be a question of a short time when hard-paved country roads will be the rule instead of the exception. This will open up a wonderful future to the manufacturer of vitrified paving brick. It is already a common thing up around Cleveland, where fine brick roads prevail, to meet a heavily laden motor truck out some thirty to fifty miles from the city, delivering merchandise along the road and getting back to Cleveland that same night. A. SAINT.

If 1916 does not prove a boom year in business of all kinds all around, including building operations, it will miss a mighty good chance and belie all signs and indications. Are you prepared to make your part of the boom a lively one?

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Do the Gases From Brick Kilns Damage Vegetation?

Editor The Clay-Worker:

I am enclosing you $2.00 for The Clay-Worker for another year, which I am glad to say has been very helpful to me in the past. We have had some complaint from our neighbors, claiming the gases from our kilns have damaged their corn, wheat and even their timber. We would appreciate very much your opinion.

Thanking you in advance,

Yours very truly,
WAYNESBORO BRICK & SUPPLY CO.,
S. D. Hockman, Secretary.

A Prophetic Wish.

Editor The Clay-Worker:

We are in the habit of wishing each other a Happy and Prosperous New Year, and we believe that the wish which we now extend to you is prophetic.

When prices advance, business is good; and when business is good, prices advance. Both of these conditions now exist.

Ergo! We predict an advance in the price of brick in the near future, every other commodity has already advanced.

"A word to the wise is sufficient."

Yours very truly,
W. E. DUNWODY,
Macon, Ga. President Standard Brick Company.

Clay-Worker Calendar Makes A Hit.

Mr. T. A. Randall,

Dear Sir—Enclosed we hand you check for subscription—$2.00—which we do with much pleasure. It just occurs to the writer that we should have added something to this check, because we wish a few more of your pretty little hat calendars. You enclosed one, which got into other hands immediately. Have you them to spare?

The Clay-Worker is very much appreciated and enjoyed. Should anything of apparent value to the brickmaking industry materialize with us, we might write you the fact. But we could not essay to add to the good features of The Clay-Worker.

We wish you much happiness and continued prosperity.

Yours truly,
FULCHER BRICK COMPANY,
Nashville, Tenn. R. H. Howell, Secretary.

Brick For Garden Walks.

Editor The Clay-Worker:

In your December issue, I notice a letter from Mr. M. G. Merritt, asking for advice as to a good paving brick for artistic garden walks, and I am glad to inform him that in England they make a brick called a clinker, which is 4x2¼x2½. It is made in several colors to work together and is burned hard enough to resist water. Then they also make a 9x4½x2 diamond checkered paver for the same work, and a 6x6x2 quarry tile for the same work. It must be borne in mind that they must all be made in a first-class manner and burned hard to resist the weather. If Mr. Merritt wants a border he could get either a fancy garden tile or a curbing brick. He also wants to know about a step. He needs a big brick for that. For a step three feet wide, he would need two brick 18x10x3. Either buff or red would look well. If Mr. Merritt wants more information in regard to artistic brick walks, let him ask through The Clay-Worker, and I will answer him in the same way, but he wants to bear in mind that if he wants something good and lasting he must pave his walks with good brick. MOMENCE.

Greetings From Sweden.

Dear Mr. Randall:

On January first I will leave the clayworking business to interest myself in the copper industry and change my address from Torekow to Helsingborg. However, I want you to continue to send me The Clay-Worker, as I by no means want to lose my contact with my American friends in the clayworking field. The paper Tegel will be published as before.

The Swedish brick industry was very dull in 1915, I must confess. The roofing tile manufacturers did very well. We have suffered very much from this cruel war. The building trade is nearly zero so far as private work is concerned. Only public buildings are planned for next year. The "Build with Brick" movement was received with sympathy, as our wood may be used to better purpose in Sweden than to build houses.

Please accept Mrs. Cronquist's and my best wishes for yourself and family, office force and your journal for a brighter and more prosperous New Year.

Yours faithfully,
G. Wson Cronquist.

December 21, 1915.

Announcement of Annual Convention of the Iowa Clay Products Manufacturers' Association.

Editor The Clay-Worker:

The special attention of Iowa clay products manufacturers is called to the annual convention of this association, which, on the invitation of the Iowa State College at Ames, Iowa, extended through Prof. Homer F. Staley, in charge of the Ceramic School, will be held at the college on February 3 and 4, 1916.

During the week of January 31-February 5 a particularly interesting Farmers' Short Course will be held.

Permanent Farm Buildings will be the keynote of the Short Course work. The college will present this question to the 2,000 progressive farmers who will be in attendance, in no uncertain manner. Barns, silos, chicken houses, hog houses, granaries, water tanks, shelter sheds, corncribs and other farm buildings take $40,000,000 annually of the Iowa farmers' money.

The State College teaches farm economics, and it is therefore much alive to the interests of the farming industry, upon which the prosperity of the state depends. Nothing is more natural therefore than that they wish the producers of the most dependable material—clay products—to come in direct contact with the most progressive of the farming industry, who will attend the Short Course. Every manufacturer of clay products should become fully acquainted with the work which has been done at the State College and with the work it has planned to do. The college cannot well advise the farmer that he should use any special material from which to erect permanent buildings. Since the clay interests really have a superior material, the college will, in the interest of the farmers, do all that it can consistently to advance the use of clay products. There will, however, remain a little for the clay products manufacturer to do in the presentation of burned clay products to the attention of Iowa's builders of prosperity.

This convention surely presents an opportunity.

There is no special appeal in this letter. It is intended purely as an advertisement of a free opportunity. No one attending the convention need be in any way held back because of the fact that this association has an annual dues fee of $10.00. The conventions are open to all comers. This is an association of clay products manufacturers. Every manufacturer has an equal voice in the proceedings of the general convention. The policy of the association is in the hands of those who attend the conventions. Majority rules. It does not matter whether a manufacturer is backed by a plant with one kiln or one with forty kilns; his vote counts equally with others. It does not seem, therefore, that the association can hope to maintain much of an existence excepting as a technical association—that is, one which does not seek to accomplish anything aside from holding an annual convention, at which vexing manufacturing questions may be freely discussed. The trade association is different. It seeks to accomplish something for the general good of the industry. It works all the year. These are not successfully carried out without money. They mean more, cost more and must be differently governed. Membership in a trade association is an asset. Assets are not obtained without expense, so trade associations are costly. This association is not a trade association. It is not much of an expense to belong. Its dues can be made $1.00 or $2.00 yearly. It can hold successful conventions and can be made worth while to a greater extent than the cost of membership would indicate.

In the clay industry, as in many other industries, trade associations are being formed. The clay industry has formed an active year-through association in Iowa, which will mean much to its members. They are subscribing from $25.00 to $100.00 per month in its support. The society is on a permanent footing and will eventually spend many thousands of dollars each year in promoting the good of the clay industry. It is a privilege to be a member—a privilege which will soon be much prized.

Prof. H. F. Staley, of Ames, has agreed to provide the association with some able talks during the convention and will arrange for a discussion of technical subjects. Our first session will be purely a business session. Everybody welcome and everybody free to vote upon the policy of the association. If there are points needing attention in the conduct of the affairs of the association, they can be properly regulated at the convention.

It is to be hoped that every manufacturer of clay products in Iowa will attend this convention. It will be a week full of good things, and in the attendance during the days of the Short Course, as well as of the association's convention, every manufacturer will find much profit.

EXECUTIVE COMMITTEE,
By C. B. PLATT, Secretary.

Preliminary Announcement for the Illinois Clay Manufacturers' Association.

Editor The Clay-Worker:

As a preliminary to the Illinois Clay Manufacturers' Association in Peoria, February 8, 9, 10, would advise that on Tuesday evening the members will be in the hands of the Peoria people. This is the first evening, and I trust that we will have a good turn-out, as I am sure from reports that we will have something worth while in a social way. Tuesday evening is the annual banquet. We will have with us Mr. F. C. Schwedtman, of the National City Bank of New York, on the topic of "Live and Let Live." Many members will remember Mr. Schwedtman's talk on "Efficiency." We will also have other live topics, such as "Coal Measure," "Sales," "Cost Accounting," "Observations Among Clayworkers," a representative of the Interstate Commerce Commission, "Freight Rates," and many other live, interesting topics along the manufacturing, selling and shipping lines.

Very truly yours,
A. E. HUCKINS, Secretary.

NEW JERSEY CLAYWORKERS.

THE ANNUAL meeting of the State Association of Clayworkers was held at New Brunswick, N. J., December 23. There was a good attendance and a number of very instructive papers pertaining to the various phases of brick and pottery manufacture were presented and discussed. New Jersey being the first state in the nation in the production of sanitary ware, that branch of the work was, of course, well represented. Dr. Twitchell, one of the speakers, stated that New Jersey stands second in the manufacturing of fireproofing, floor and wall tile, terra cotta and pottery products; third in porcelain electrical supplies; fourth in the production of face brick, and fifth in the production of common brick.

The proceedings of the meeting will in due time be published in book form, and those desiring same can obtain copies from Secretary C. Warren Parmelee, who is Dean of the Ceramic Department of the Rutgers College, at New Brunswick.

The election of officers resulted as follows: President, Charles Weelans, Trenton; vice-president, Howard N. Valentine, Woodbridge; secretary and treasurer, C. W. Parmelee, New Brunswick; executive committee, H. C. Meyerhoff, Little Ferry, D. H. Applegate, Red Bank, Samuel Bedson, Trenton, D. F. Sayre, Sayreville, August Staudt, Perth Amboy, and John H. Leisen, Woodbridge. The retiring president, Charles A. Bloomfield, was unanimously elected a life member of the executive committee.

NEW YORK CLAYWORKERS FORM STATE ASSOCIATION.

Representative men engaged in the clay business in the State of New York gathered at Syracuse, December 18, and perfected a State Association, the aims and purposes of which are to promote the various clay industries through educational means. One of the chief means will be the support of the State School for Clayworking and Ceramics at the Alfred University, which for several years has been doing excellent work under the direction of Prof. Charles Binns. Eight students of the Alfred school attended the convention, and stopped on the way at Corning to inspect the plant of the Brick, Tile and Terra Cotta Company, that city, as the guests of M. E. Gregory, the proprietor. The latter was elected president of the association for the ensuing year. H. E. Jensen, of Brooklyn, was elected vice president, and Prof. E. R. Montgomery, of Alfred, was elected secretary-treasurer.

OREGON CLAYWORKERS ASSOCIATION.

The second annual convention of the clayworkers of Oregon and the Northwest is scheduled for February 9 and 10, and will be held at the Hotel Albany, Albany, Ore. Secretary S. Geijsbeek, of Portland, writes that an interesting program has been prepared, and it is anticipated that the clayworkers of that section will be present en masse.

OBITUARY.

Mrs. Elizabeth Billingsley, widow of the late J. J. W. Billingsley, died at her home near Indianapolis, December 22, at the age of 82. She is survived by six children, among whom are Denton F. Billingsley and Mrs. T. A. Randall.

BRICK FOUND BEST
IN EVERY TEST.

FOR GENUINE ECONOMY
BUILD WITH BRICK.

FOR COMING GENERATIONS
BUILD WITH BRICK.

TO BE UP TO DATE
BUILD WITH BRICK.

WHEN IN DOUBT USE BRICK.
BRICK DEFY THE ELEMENTS.

HOMES YOU ADMIRE MOST
ARE BUILT WITH BRICK.

BUILD WITH BRICK,
THE EVERLASTING MATERIAL.

GOOD ADVICE TO YOUNG AND
OLD, "BUILD WITH BRICK."

CONGRATULATE YOURSELF WHEN
YOU "BUILD WITH BRICK."

NO REGRETS AFTERWARDS
IF YOU BUILD WITH BRICK.

BRICK ARE CHEAP IN EVANSVILLE. BUILD WITH BRICK.

SET A GOOD EXAMPLE FOR
OTHERS. "BUILD WITH BRICK."

LET THE OTHER FELLOW WORRY,
YOU BUILD WITH BRICK.

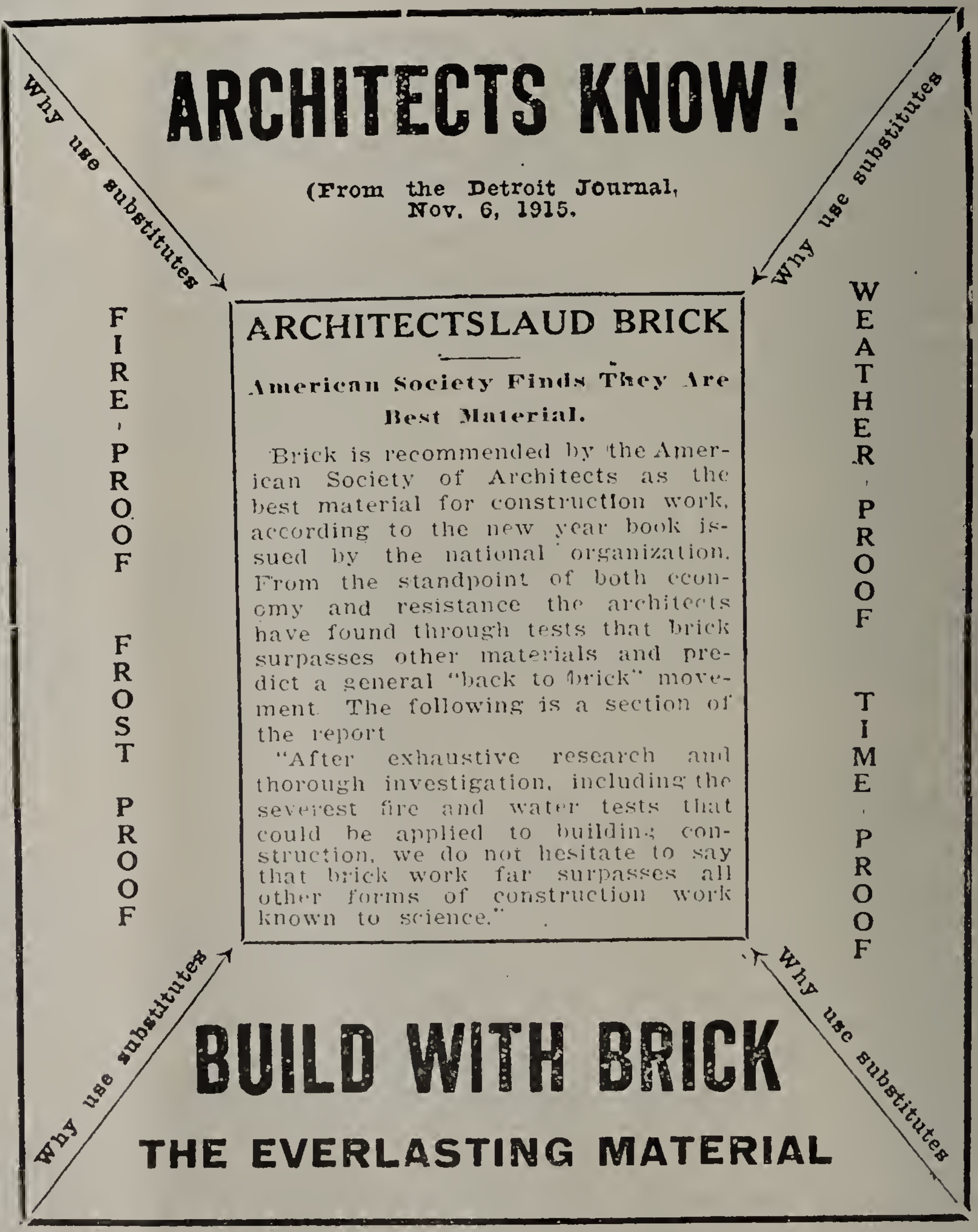
LET THE TREES GROW.
BUILD WITH BRICK.

CONSIDER THE FUTURE.
BUILD WITH BRICK.

IT'S WORTH THE PRICE
TO BUILD WITH BRICK.

BUILD WITH BRICK.

Realizing that there are possibilities before the people of the country in the way of better and more satisfactory homes for practically the same money it has cost heretofore to build the less pretentious frame houses, and that the public as well as the brick manufacturing fraternity will be benefited thereby, the brick manufacturers of the country, under the slogan of "Build With Brick," have organized a boosting bureau for the purpose of educating the public in the matter of brick building. It is contended that the reason there has not been a greater percentage of brick building heretofore is that too many people think it costs too much money to build a brick home, which is really the ideal of practically every home-builder. To assist in this campaign of education, the Building Brick Bureau has issued a book of distinctive brick homes, which contains a series of plans and pictures, with architectural descriptions, of a number of modern homes to not cost above $7,500. There are also included some figures of the comparative cost between wood and brick in building operations. There are represented in the book the ideas of more than a dozen different architects, and these ideas are assembled in practical form, so that they furnish not only attractive plan outlines, but definite information as to details and cost of building that should be valuable to every architect or prospective builder. The book is beautifully printed and includes color plates, and while intended primarily for architects, should prove equally valuable to any prospective builder or any building contractor seeking for plan outlines with which to interest prospective builders. It is issued by the National Building Brick Bureau at Indianapolis, Ind.



ARCHITECTS KNOW!

(From the Detroit Journal,
Nov. 6, 1915.

Why use substitutes

Why use substitutes

FIRE-PROOF FROST PROOF

WEATHER-PROOF TIME-PROOF

ARCHITECTSLAUD BRICK

American Society Finds They Are Best Material.

Brick is recommended by the American Society of Architects as the best material for construction work, according to the new year book issued by the national organization. From the standpoint of both economy and resistance the architects have found through tests that brick surpasses other materials and predict a general "back to brick" movement. The following is a section of the report

"After exhaustive research and thorough investigation, including the severest fire and water tests that could be applied to building construction, we do not hesitate to say that brick work far surpasses all other forms of construction work known to science."

Why use substitutes

Why use substitutes

BUILD WITH BRICK

THE EVERLASTING MATERIAL

Advertisments Used by the Detroit Brick Mfrs,'

HOW THEY DO IT IN EVANSVILLE.

WIDE-AWAKE, catchy advertising has been a regular product of the Standard Brick Manufacturing Company, of Evansville, since even before the days when the "Build With Brick" slogan attained fame.

Under the guiding ministrations of John Andres this concern was not only the first to make effective use of "Build With Brick" as a catch-line slogan, but for some time now they have put some new wrinkles in it characteristic of how they do things unique and original in Evansvlile.

Instead of taking space in the regular advertising columns of their daily papers and making display ads, they have arranged with two of the local papers for space in the news column, in which they run a line or two of black-faced type here and there. One day they will simply have a line saying "Build With Brick," and the next day they will run a couplet, of which they have made up quite an extensive list, so that they can vary them from day to day. The firm name is not used at all, and the whole advertising energy is directed at the one point of impressing people with the idea they should build with brick.

They are free-handed people, as well as forceful in their advertising, and advise us that if any one else wants to follow the same methods and benefit from their experience, they are perfectly welcome to do so.

On this page, and the one preceding, are given the catch lines used by the Standard Brick Manufacturing Company, of Evansville, Ind., in their local campaign. Many of these expressions are original with that company, and a few were taken from copies of advertisements published in The Clay-Worker in the department styled "Free Publicity Service for Our Readers." Use them in your local papers. Boost the Build With Brick game.

Brick needs no paint.

Brick needs no paint.

ANOTHER REASON

From The Detroit News 10-16-15.

DELAY IN PAINTING COSTLY--SCHROEDER

Schroeder Paint & Glass Co. Insures Homes Against Decay.

Weather Proof.

Frost Proof

"The way to save money on painting is to paint as soon as a house needs painting," says Fred W Schroeder, of the Schroeder Paint and Glass Co., 47-55 Cadillac square.

"No one ever postponed painting for a year after it was needed that it did not cost him much more than he saved If paint is peeling, or scaling off, the lumber is unprotected from moisture and decay and the depreciation in 12 months is considerable.

But beyond this is the discontent that a shabby house engenders in its occupants. The cost of building has mounted so high that people cannot afford to allow their buildings to depreciate in value for want of paint."

Time Proof

Fireproof.

Brick needs no paint.

Brick needs no paint.

BUILD WITH BRICK

The Everlasting Material.

and Dealers Ass'n in Their Local Newspapers.

EXERCISE GOOD JUDGMENT.
BUILD WITH BRICK.

PROFIT BY EXPERIENCE.
BUILD WITH BRICK.

REDUCE THE FIRE HAZARD.
BUILD WITH BRICK.

HELP BEAUTIFY THE CITY.
BUILD WITH BRICK.

YOU CAN'T DO BETTER
THAN BUILD WITH BRICK.

YOUR DUTY TO YOURSELF
IS BUILD WITH BRICK.

SHAKE HANDS WITH QUALITY.
BUILD WITH BRICK.

THE TEST OF TIME TELLS.
BUILD WITH BRICK.

YOUR WANTS AND YOUR WELFARE
SAY BUILD WITH BRICK.

FIRST COST—LAST COST.
BUILD WITH BRICK.

KEEP UP WITH THE PROCESSION.
BUILD WITH BRICK.

THE BRICK HOME COMMANDS
RESPECT AND ADMIRATION.

HELP CREATE BETTER VALUES.
BUILD WITH BRICK.

APPEARANCES COUNT FOR
MUCH. BUILD WITH BRICK.

ELEVATE THE TONE
OF YOUR NEIGHBORHOOD.
BUILD WITH BRICK.

FOR BEAUTY, COMFORT, FIRE-
SAFETY, "BUILD WITH BRICK."

OFFICIAL ANNOUNCEMENT.

Thirtieth Annual Convention of the National Brick Manufacturers' Association and Allied Organizations, to Be Held at the Statler Hotel, Cleveland, Ohio, February 21 to 26, 1916.

The National Paving Brick Manufacturers' Association Will Meet at the Statler Hotel, Beginning Monday, February 21.

The American Ceramic Society Will Hold Its Eighteenth Annual Convention at Cleveland, Beginning Monday, February 21.

☞Reduced Railroad Rates Have Been Granted by the Central Passenger Association.☜

AS PREVIOUSLY ANNOUNCED, the thirtieth annual convention of the National Brick Manufacturers' Association will be held at Cleveland, Ohio, February 21 to 26, 1916. Cleveland's central location makes it very convenient for a vast number of the clayworkers of the country. The splendid train service from all directions enabling the members to reach Cleveland conveniently and quickly insures an exceptionally large attendance.

Reduced Railroad Rates.

The Central Passenger Association has granted a low round trip rate from points in its territory and this has been concurred in by the Trunk Line and New England Passenger Associations. Under the concession, tickets may be purchased through to Cleveland, February 19, 20 and 22, and will be good returning until March 1, 1916. No certificate need be taken. Instead delegates will purchase round trip tickets for themselves and those accompanying them. Delegates coming from points south of the Ohio and west of the Mississippi may use their local mileage to such points as Cincinnati, Louisville, St. Louis and Chicago, and there repurchase tickets to Cleveland and return.

Statler Hotel Headquarters.

Again N. B. M. A. delegates will be afforded splendid hotel accommodations; the new Hotel Statler, with the recent addition, has 1,000 rooms, each with bath and toilet. The rate will range from $1.50 per day per guest up. They have 200 rooms at the minimum rate named, each having shower bath; another 200 rooms at from $2.00 to $2.50 per day, and 600 additional guest rooms at $3.00 per day and upward, owing to location, size of room, etc. In requesting reservations, delegates should state character of accommodations desired, number in party and date of intended arrival. Those desiring parlors or special quarters will be afforded same at reasonable rates for the accommodations desired, and the service will be Statler service, than which there is none better.

Convention Hall and Exhibition Room.

The sessions of the National Association will be held in the ballroom of the Statler hotel and a room adjacent thereto will be used as an exhibition room for the display of specimen brick, tile, etc., trade literature, etc. No machinery will be displayed in this room; those desiring to exhibit machinery may make arrangements to do so in their private rooms on application to the manager of the hotel.

N. B. M. A. Program.

As in former years the auxiliary organizations will meet Monday and Tuesday in the various convention halls of Hotel Statler. The first session of the N. B. M. A. will occur Wednesday afternoon, February 23, at 2:00 p. m., and the convention will continue Thursday and Friday interspersed with such entertainment as may be afforded by the local entertainment committee. The smokerette will be held Wednesday evening, and the annual banquet Thursday evening. The following formal papers will be presented:

The N. B. M. A.

Its Aims and Achievements.

The National Brick Manufacturers' Association is distinctively an educational organization, and was so intended from its inception in 1886. It has never been commercialized; it has never undertaken to influence markets and prices, except as that may be done through the betterment of a product and the consequent increase in the demand for same. Its purpose has ever been to promote the interests of the makers and users of clay products; it has fulfilled its mission in a very large measure, and accordingly is entitled to much credit for the progress that has been made in the intervening years. The result is due as

Convention Papers.

"Old Versus New Methods of Trucking Brick" (Illustrated)—Lemon Parker, St. Louis, Mo.

"Recent Progress Toward the Standardization of Building Brick"—Edward Orton, Columbus, Ohio.

"The Commercial Side of the Brick Business"—L. K. Brown, Zanesville, Ohio.

"The Use of Clay Products for Farm Buildings in Iowa" (Illustrated)—Homer F. Staley, Ames, Iowa.

"Efficiency Engineering for Brick Plants" (Illustrated)—E. C. Hillery, Raleigh, N. C.

"Clay Testing" (Illustrated)—H. B. Henderson, Columbus, Ohio.

"What's the Matter with the Brick Business" (Illustrated)—Wm. B. Wreford, Detroit, Mich.

"Elements of Cost in Brickmaking" (Illustrated)—R. D. Herbert, Nashville, Tenn.

"Insurance for Brick Plants"—Hubert Somers, Atlantic City, N. J.

"Transverse Tests of Brick in Relation to Strength of Piers" (Illustrated)—J. G. Bragg, Pittsburg, Pa.

"Progress and Prosperity"—F. W. Fitzpatrick, Washington, D. C.

'The Burning Question"—Anton Vogt, Troy, N. Y.

"As Others See Us"—Wm. G. Rose, Cleveland, Ohio.

Other subjects will be considered informally, and members desiring information on any particular phase of the business are requested to make their wishes known to the secretary and an effort will be made to have the subjects suggested given considerate attention.

The Complete Home Show.

As the trade has been advised, there is to be a great complete Building Show at Cleveland, beginning Wednesday, February 16 and continuing until Saturday, February 26. The chief purpose of this great exposition is to demonstrate to the builders of the nation the importance of building incombustible structures. It is anticipated that the display will prove of great material value to the manufacturers of clay products for structural purposes. Ample time and opportunity will be afforded the delegates to visit this great exhibit which will be held in the Coliseum, a block east of Hotel Statler. No other building material has been improved in both form and color to the same degree of perfection as have brick and tile in the past decade, hence this exhibition ought to prove of great benefit to the clay crafts, every member of which will profit by visiting it.

much perhaps to the spirit of good will which it has engendered in the trade as to the spirit of progress which has characterized its work. A wonderful power for good is brought into play when representative men engaged in a common calling are brought together in a manner to create and cement friendships and so induce cordial, confidential interchange of business experiences and trade information. The discussion of vital questions of common interests, which are considered both on the floor of the convention and in the lobby, or buttonhole talks, is a source of much benefit. It is proverbial that one gets out of an organization in proportion as he contributes to it. It pays and pays big to participate in this organized effort for the betterment of all clay industries.

All Sessions Open to the Public.

All sessions of the National convention are open to the public. Those who are interested directly or indirectly in any branch of the clay industry are invited to attend the convention and join the Association. Those desiring information as to requisite of membership, etc., are requested to communicate with the secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,
C. P. Mayer, President.
Theo. A. Randall, Secretary.

CONVENTION DATES.

Wisconsin Clay Manufacturers' Association, Republican House, Milwaukee, Wis.	Jan. 27 and 28.
The Iowa Clay Products Manufacturers Association, Iowa State College, Ames, Iowa.	Feb. 3 and 4.
Oregon Clayworkers' Association, Albany Hotel, Albany, Ore.	Feb. 9 and 10
The Illinois Clay Manufacturers' Association, Hotel Jefferson, Peoria, Ill.	Feb. 8, 9 and 10.
The National Builders' Supply Association, Hotel Statler, Cleveland, Ohio.	Feb. 17, 18 and 19.
The American Ceramic Society, Cleveland, Ohio.	Feb. 21, 22, and 23.
The National Paving Brick Manufacturers' Association, Hotel Statler, Cleveland, Ohio.	Feb. 21 and 22.
The National Brick Manufacturers' Association, Hotel Statler, Cleveland, Ohio.	Feb. 23, 24, and 25.
The National Clay Machinery Manufacturers' Association, Hotel Statler, Cleveland, Ohio.	Feb. 22.

THE AMERICAN CERAMIC SOCIETY.

Eighteenth Annual Meeting.

The coming annual meeting of the American Ceramic Society promises to be one of unusual importance to the members of that association. Secretary Edward Orton announces that the usual list of good things will be included in the regular program, which is in course of preparation. The headquarters for the society will probably be at the Hotel Statler.

Volume Seventeen of the Transactions.

A book of very substantial proportions has just recently been sent to the members, being a complete report of all the papers and transactions of the society during 1915. It comprises 816 pages of ably edited literature dealing with the scientific and technical side of ceramic work. It ought to find a place in the library of every student of ceramics. Nonmembers will be furnished this volume bound in cloth, for $6.25. For further information in regard to the transactions of the society or the program for the coming annual convention, address Secretary Edward Orton, Columbus, Ohio.

AN IMPORTANT GATHERING OF BUSINESS MEN.

A meeting of the foremost business men of the nation will convene at Washington, D. C., February 8, 9 and 10, when the annual convention of the Chamber of Commerce of the United States will be held there. It is anticipated that many matters of great importance to the commercial and manufacturing interests of the nation will be considered and that action will be taken which will have a marked influence on our national legislation as it pertains to business questions, such as the establishment of a tariff commission which will take that momentous question out of politics. Other matters of almost equal importance will be discussed by men recognized as leaders in the various fields of commerce and industry.

It is announced that the Richardson-Lovejoy Engineering Company, Columbus, Ohio, has been dissolved and the business will be carried on in the future under the personal supervision and direction of Mr. Ellis Lovejoy. This is really a change in name only, as Mr. Lovejoy has in fact been managing the business for several years. He will continue the business of consulting engineer to the clay industries, factory architect, etc., the same as heretofore, with offices in the Schultze Building, Columbus.

John Berwald, for many years intimately associated with the Davenport Brick & Tile Co., Davenport, Iowa, has retired from that firm, and it is rumored locally that he is to be a candidate for mayor of Davenport on the Democratic ticket.

THE COMPLETE BUILDING SHOW.

Attractive Exhibits of Various Building Materials, a Prize Architectural Contest, a $3,000 Model Brick Home to be Given Away, Chief Points of Interest.

THE EDITOR has heard from the management of the Complete Building Show, to be held in Cleveland, O., February 16 to 26, that that exposition of building materials and equipment is going big—bigger, in fact, than even their expectations, which, in the case of show managers, is apt to be somewhat rosy.

With a complete house to be given away free, seven monster community exhibits, an architectural competition, and more than two hundred individual exhibits of materials and equipment for all kinds of buildings, they say this exposition promises to be the greatest of its kind ever held in this country.

More than 5,000 delegates will attend conventions to be held in Cleveland during the exposition, representing clay products, lumber, hardware, paints and builders supplies. These, with trade visitors and regular attendance, are expected to swell the estimated total for the ten days to close to 200,000.

Instead of the usual endless array of individual exhibits of brick, tile, cement and lumber, the interests in these various branches of manufacture have joined hands in community displays of their various products. The lumber dealers, for example, will build several miniature houses of various woods; the tilemakers will have sections of exterior walls, floors, partitions, etc.; the face brick and the paving brick makers will have house, lawn and garden structures; common brick will have a Dutch cottage interior, with a monster fireplace; the cement makers will have block, brick and molded materials.

Many new products will be on display for the first time at the Complete Building Show. Among these will be self-facing hollow building tiles, new shades and styles of brick, large unit brick which produce hollow walls, cement ornaments, fire-proofing systems employing expanded metals, gypsum and other retardants, in addition to a great number of newly patented safety and labor-saving devices for the home, the commercial building and the factory.

The art section will include a number of painters and sculptors at work, and, in addition, a model of the prize-winning house design, with a full-size plan of its first-story arrangement.

An adjunct to the art section will be a number of bronzes from one of the country's most famous firms of coppersmiths.

An idea of the great variety of exhibits is indicated by the following partial list of exhibitors:

HOUSE PLANS AT THE BUILDING SHOW.

One of the features of the Complete Building Show at the Coliseum, Cleveland, will be in the house plans resulting from a competition for $500 in prizes, which has been offered for the best design for a house to cost $3,000. Special arrangements are being made to visualize the first prize plans in the exposition. The Cleveland Art Association will erect at the Complete Building Show a miniature model of the prize-winning plan and will surround this with the room arrangements in full scale, each room completely decorated and furnished.

The competition is under the direction of the Cleveland Chapter, American Institute of Architects, in co-operation with the Cleveland Art Association, the Cleveland Builders' Exchange and other civic organizations of the city.

The announcement of this contest carries all details of the conditions surrounding the contest, and it should serve to bring out several interesting features. The contest is not limited to brick, but includes any and every building material that may be used for a house not to cost more than $3,000 and to include not less than the following rooms: Living room, dining room, or combination of these two rooms, kitchen, three bedrooms and bathroom. There is also to be a basement, and the cost of all, excluding the land, must not exceed $3,000 on a cubing basis of 17 cents per cubic foot.

The results should show some interesting features of comparative cost of the different building materials used for the same kind of a structure, as well as bring out features of qualities of each for utility and beauty. Naturally we hope that some design made of brick will win the prize, but whether it does or not, this contest should bring out many interesting things worth noting, and the results of it will furnish a valuable feature of the exhibits shown at the great Building Show.

CASTING A CLEVELAND MIXTURE.

The fates are casting quite a mixture of interests for Cleveland, and the big Building Show during that red-letter week of February 20 to 26, when the National Brick Manufacturers' Association will set up its thirtieth milestone and hold the biggest convention on record. There are some other conventions booked for the same week, one of which is the convention of the Ohio Association of Retail Lumber Dealers, which is scheduled to meet February 22, 23, 24.

This live-wire bunch of lumbermen have taken notice of the fact that there will be conventions at the same time of other building material interests, and they are preparing to come in force and be a headline attraction themselves in the midst of all the doings. They have secured Grey's Armory for a convention hall, but have not so far named any specific hotel as headquarters.

This is seemingly putting a spirit of rivalry into the situation for the convention week, and it behooves the brickmakers to show their strength in numbers as well as the strength and durability of their material, and exert themselves in every way to make the kind of a showing their material is entitled to at this great Building Show, which is the best showing of all. Also, it is in order for us to have a convention of impressive magnitude and mobilize the brick fraternity in larger numbers than ever were brought out before.

Incidentally this mixing in of several important conventions for the same week may tax the hotel capacity of the city, so it is well to be forehanded in the matter. Make your reservations early, so as to be safe in the matter of accommodations.

THE BACKBONE OF THE INDUSTRY.

Common brick is the backbone of the brick industry, just as the common people are the backbone of the nation. It represents the biggest single item in the clayworking industry, with a total value of more than twice that of any other clay product, with the exception of pottery.

Common brick, like many of the common people, has been neglected because the attention of the live wire boosters has been concentrated on fancy clay products with distinguished features. As a result, the backbone of the industry has not increased in size or strength the past ten years, but is doing well to hold its own under existing conditions.

Existing conditions of neglect of the common brick industry should no longer be tolerated. It is time for the strenuous live-wire action looking to the upbuilding of the common brick industry and to the enlarging and strengthening of the backbone of the clayworking business.

Let us turn to and make common brick an uncommonly good product to manufacture and sell.

List of Exhibitors in the Complete Building Show.

American Building Brick Co.	Cleveland, O.
American Gypsum Co.	Port Clinton, O.
Alpha Portland Cement Co.	Easton, Pa.
Atlas Portland Cement Co.	New York City
Alliance Brick Co.	Alliance, O.
Bishop-Becker-Babcock Co.	Cleveland, O.
Brick & Clay Record	Chicago, Ill.
Barkwill Brick Co.	Cleveland, O.
Belden Brick Co.	Canton, O.
Beaver Clay Mfg. Co.	New Galilee, Pa.
Barner Mead Lumber Co.	Cleveland, O.
Broadway Lumber Co.	Cleveland, O.
Brooklyn Lumber Co.	Cleveland, O.
Berger Mfg. Co.	Canton, O.
Cleveland Board Lumber Dealers	Cleveland, O.
Cleveland Window Glass Co.	Cleveland, O.
Cleveland Stone Co.	Cleveland, O.
Cleveland Builders Supply Co.	Cleveland, O.
Cuyahoga Builders Supply Co.	Cleveland, O.
Cleveland Material Co.	Cleveland, O.
Camp Conduit Co.	Cleveland, O.
Cuyahoga Brick & Shale Co.	Cleveland, O.
Clay-Worker	Indianapolis, Ind.
Construction	New York City
Cleveland Art Ass'n	Cleveland, O.
Colonial Pressed Brick Co.	Mogadore, O.
Crescent Portland Cement Co.	Wampum, Pa.
Cuyahoga Lumber Co.	Cleveland, O.
Cleveland Lumber Co.	Cleveland, O.
Corlett Lumber Co.	Cleveland, O.
Cleveland City Lumber Co.	Cleveland, O.
Collinwood Lumber Co.	Cleveland, O.
Collamer Lumber Co.	Cleveland, O.
Samuel Cabot, Inc.	Boston, Mass.
Cleveland Electrical Contractors Ass'n.	Cleveland, O.
Connelly Co.	Cleveland, O.
Cleveland Cyclone Fence Co.	Cleveland, O.
Davis-Hunt-Collister Co.	Cleveland, O.
Deckman-Duty Brick Co.	Cleveland, O.
Dunn-Wire-Cut-Lug Brick Co.	Conneaut, O.
Donley Bros. Co.	Cleveland, O.
Darlington Brick & Mining Co.	Pittsburg, Pa.
Euclid Builders Supply Co.	Cleveland, O.
Everhard Co.	Massillon, O.
East Cleveland Lumber Co.	Cleveland, O.
Edgewater Lumber Co.	Cleveland, O.
Erner Electric Co.	Cleveland, O.
Farr Brick Co.	Cleveland, O.
Forest City Paint & Varnish Co.	Cleveland, O.
O. H. Foote Lumber Co.	Cleveland, O.
Fisher-Wilson Co.	Cleveland, O.
Fisher-Jirouch	Cleveland, O.
E. Fisher Co.	Cleveland, O.
General Fire Extinguisher Co.	Providence, R. I.
Glemville Lumber Co.	Cleveland, O.
Gray Lumber Co.	Cleveland, O.
Gill Lumber Co.	Cleveland, O.
Home Builders Corporation	Cleveland, O.
Holland Furnace Co.	Holland, Mich.
Huron Portland Cement Co.	Detroit, Mich.
Heppes Co.	Chicago, Ill.
Independent Lumber & Door Co.	Cleveland, O.
Kansas Buff Brick Co.	Kansas City, Mo.
Kelley Lime & Transport Co.	Cleveland, O.
J. B. King Co.	Buffalo, N. Y.
Knapp Bros. Mfg. Co.	Chicago, Ill.
Keim Brick & Tile Co.	Louisville, O.
Kohler Co.	Chicago, Ill.
Koasbey & Mattison Co.	Cleveland, O.
Lakewood Masons Supply Co.	Lakewood, O.
Lehigh Portland Cement Co.	Allentown, Pa.
Lake Shore Saw Mill & Lumber Co.	Cleveland, O.
Lakewood Lumber Co.	Lakewood, O.
Lake Erie Lumber Co.	Cleveland, O.
Lorain St. Lumber Co.	Cleveland, O.
Ludowici-Celadon Co.	Cleveland, O.
Martin-Barriss Co.	Clevealnd, O.
Murphy Door Bed Co.	Chicago, Ill.
Minneapolis Heat Regulator Co.	Minneapolis, Minn.
Mouat-Squires Co.	Cleveland, O.
Mathews Mfg. Co.	Cleveland, O.
Martinsville Brick Co.	Martinsville, Ind.
Mills-Carleton Co.	Cleveland, O.
J. H. McLain Co.	Canton, O.
National Paving Brick Ass'n.	Cleveland, O.
John Henry Newson	Cleveland, O.
National Heater Co.	Cleveland, O.
National Lumber Mfrs. Ass'n	Cleveland, O.
Nicola, Stone & Myers Co.	Cleveland, O.
Ohio Quarries Co.	Cleveland, O.
Ohio Clay Co.	Cleveland, O.
Ohio Face Brick Dealers Ass'n.	Cleveland, O.
Prudential Building Co.	Cleveland, O.
Pattison-Leitch Co.	Cleveland, O.
Potter-Teare & Co.	Cleveland, O.
Prasse Lumber Co.	Cleveland, O.
Peters Millwork & Lumber Co.	Cleveland, O.
Reinforced Concrete Flooring Co.	Cleveland, O.
Rock Products & Building Materials	Chicago, Ill.
Rutherford, Geo., Co.	Cleveland, O.
Reynolds Asphalt Shingle Co.	Grand Rapids, Mich.
Redwood Mfrs. Ass'n	
Red Gum Mfrs. Ass'n	
Robinson Clay Products Co.	Akron, O.
Sandusky Portland Cement Co.	Sandusky, O.
Southern Pine Ass'n	New Orleans, La.
Standard Mfg. Co.	Cleveland, O.
Shires, W. C.	Cleveland, O.
Scientific Heater Co.	Cleveland, O.
Southern Cypress Mfrs. Ass'n	Cleveland, O.
Starkey, John	Canton, O.
Stark Brick Co.	Canton, O.
Saginaw Bay Co.	Cleveland, O.
South Cleveland Lumber Co.	Cleveland, O.
Singletary Lumber Co.	Cleveland, O.
Saunders, J. A., Co.	Cleveland, O.
Snell, N. R.	Cleveland, O.
Seattle Cedar Lumber Mfrs. Ass'n	
Teachout, A., Co.	Cleveland, O.
Underwriters Fire Equ. Co.	Cleveland, O.
Union Metal Mfg. Co.	Canton, O.
Vitrified Clay Industry	Columbus, O.
Vanport Brick Co.	Vanport, O.
Vulcanite Portland Cement Co.	New York City
Webber Co.	Cleveland, O.
Whitacre Fireproofing Co.	Waynesburg, O.
Whipple Art Glass Co.	Cleveland, O.
Wadsworth-Howland & Co.	Boston, Mass.
Wilson Av. Lumber Co.	Cleveland, O.
Whitmer-Jackson Sash & Door Co.	Cleveland, O.
Wert, C. S.	Kendallville, Ind.
Western Electric Co.	Cleveland, O.
Yale & Towne Co.	New Britain, Conn.

THE CALENDAR SHOWER.

CONTRARY to expectations, the calendar crop for 1916 is very gratifying both in quantity and quality. It had been predicted that because of poor business in 1915, there would be fewer and less expensive calendars this year than heretofore, but such is not the case, as a glimpse into our sanctum is ample proof, for our walls are decorated with calendars of all sorts and descriptions, and they are still coming. We appreciate these seasonable remembrances and thank one and all of those who have so favored us.

Our calendar shower this year is likened unto the beautiful rainbow after a summer shower. Brilliant colors and artistic illustrations predominate.

One of the first calendars we received was from the Clipperts Spaulding Company, manufacturers of common brick, building block, and drain tile with their plant at Lansing, Mich. The calendar is large and attractive, printed in orange and black, showing their products, and portraits of Mr. Geo. C. Clippert and Mr. Orlando E. Spaulding. These two gentlemen have been in the brick business for over fifty years. Mr. Spaulding holding the record with 56 years to his credit.

One of the handsomest and most appropriate souvenirs of the season came from the the Chattanooga Paint Company, manufacturers of eclipse brand of mortar colors (see ad on page 107). It is a combination of calendar and paper clip, and is both an ornament and a convenience for any business man's desk.

"Surprised at the Fountain," is the title of a beautiful calendar mailed the trade by the Roessler-Hasslacher Chemical Co., 100 Williams St., New York city, manufacturers of high grade oxides and materials used in the ceramic industries. The illustration on this calendar shows a Greek youth gently covering the eyes of a maiden, in the act of filling her Grecian pitcher with the cool water from a fountain. The more we study this calendar, the more we are fascinated with it.

The Corry Brick & Tile Co., Corry, Pa., has a splendid calendar. A picture of the plant, the home of the brick and blocks that make Corry famous, is enclosed in a red border. Boxed below is the following clever article styled:

"Knocker vs. Booster."

"Someone has said that when the Creator had made all the good things there still remained some work to be done; so He made beasts and reptiles and poisonous insects, and when He made finished there were some scraps left; so He put all these together, covered it with suspicion, wrapped it with jealousy, marked it with a yellow streak and called it a 'KNOCKER.'

This product was so fearful to contemplate that He had to make something to counteract it, so He took a sunbeam, put it in the heart of a child, the brain of a man, wrapped these in civic pride, covered it with brotherly love, gave it a mask of velvet and a grasp of steel and called it a 'BOOSTER;' made him a lover of fields and flowers, and manly sports, a believer in equality and justice, and ever since these two were, mortal man has had the privilege of choosing his own associates."

We certainly would feel disappointed if we were forgotten by our old friends Charlie Deckman and Spencer Duty. The calendar of their concern is always our principal display. The Medal Paving Brick Company (the new name for the Deckman-Duty Company) has now a capacity of repressed and wire-cut-lug Medal paving block amounting to 40,000,000. This statement of facts appears above the large calendar pad and just below a large and many-colored picture of Washington's Inauguration at Independence Hall March 4, 1793. This picture makes one wish he could step right into the scene and mingle with the handsome women and chivalrous men of those stirring days, when the real foundation of our government was being formed.

"Oh, can I have that calendar," a chorus of voices made this exclamation when the writer opened the envelope that contained the calendar of the Suffolk Clay Co., Inc., Suffolk, Va. It certainly deserved this chorus of appreciation, with the soft, warm tinted tones in the picture of The Old Homestead. The old home is most inviting and there is a sense of comfort, quietude and restfulness about the whole scene. You can almost smell the honeysuckle and the clover and you have a hankering to climb the old oak tree and swing in its topmost branches. Incidentally the Suffolk Clay Co. boosts the Build with Brick idea.

George H. Clippert & Bro. Brick Co., of Detroit, Mich., favored us with an unusual calendar with a brick wall background. The calendar pad is in the center, below is a panoramic view of the plant, while above is the firm name in black and red covering a part of a round picture of the busy city with its skyscrapers and many factories.

The Salmen Brick & Lumber Company, of Slidell and New Orleans, La., has a calendar which is most practical and useful. It consists of large single sheets for each month with dates in large figures easily read from across the room of our editorial office. Below the firm name in the center, is an oval view of the plant the large delegation visited during the New Orleans Convention. The unusual feature of this calendar is the prints of the preceding and succeeding months, which appear directly above the large calendar in either corner.

"Parry of Gary"—stands out in bold letters at the top of the twelve sheet calendar of Mr. W. H. Fyffe Parry, 1000 Broadway, Gary, Ind. He is a selling agent and broker in building materials. A catch line which hits our funny bone is this, "The man who made hod carriers out of mail carriers," referring to the fact that he was the first man who sent a brick by parcel post. We wish to compliment Parry of Gary on the usefulness of this welcome gift.

The J. C. Steele & Sons Co., of Statesville, N. C., was the only clayworking machinery concern in the business who mailed us a calendar and this one was certainly well worth while. It is a useful, artistic calendar with individual sheets for each month, giving also the preceding and succeeding months and illustrations of the J. C. Steele & Sons factory, brick machine and cutting table. This company manufactures clayworking machinery and appliances.

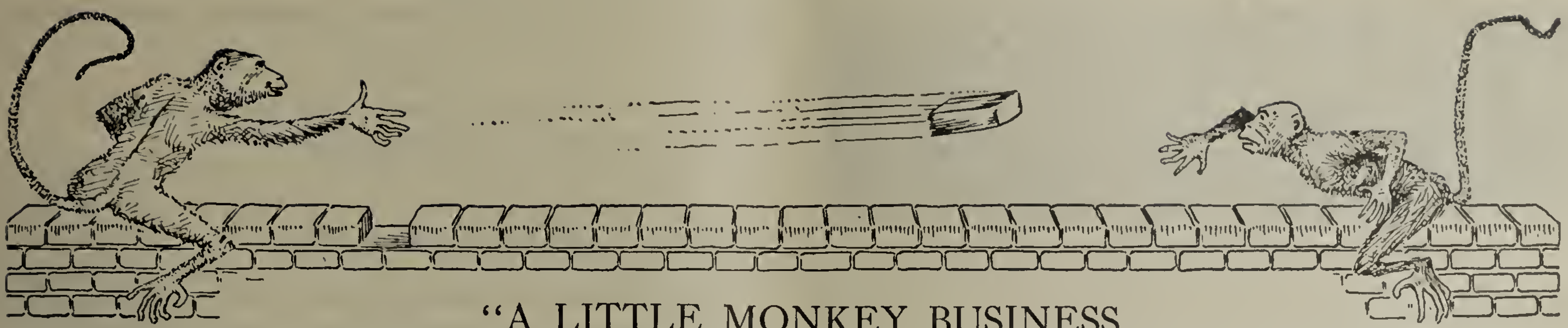
The calendar of the Don Valley Brick works, of Toronto, Can., still finds a favored spot in our display of calendars. It contains a pad with the months of both 1915 and 1916. This was received last year and preserved, because of the illustration which gives an exact reproduction of a section of their show room in the Dominion Bank Bldg., Toronto.

A Highland Farm. "Thin columns of blue smoke ascend, mingle with the twilight shades, and die in blue mid-air. We meet the herd boy bringing home the lowing kine."

This is illustrated on the calendar of The Tuttle Brick Co., Middletown, Conn., brickmakers since 1842. This is another scene which stirs up the longing for the open country, the fishing rod, and the barefoot days.

What spring would be without the robin, is what the New Year would be without one of the neat calendars from our long time faithful friend, H. A. Wheeler, E. M., consulting mining engineer, whose office is at 510 Pine St., St. Louis, Mo.

In the proposition of advertising brick we should bear in mind that it takes persistent effort to build up a permanent business and not just an occasional splurge here and there.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Real Bigness.

A Yankee clinched his argument with an Englishman as to the relative size of the Thames and the Mississippi by saying:

"Why, look here, mister, there ain't enough water in the whole of the Thames to make a gargle for the mouth of the Mississippi."

The Main Question.

Victim: "What has happened? Where am I?"

Doctor: "You have been seriously injured in a trolley accident. But cheer up—you will recover."

Victim: "How much?"

A False Note.

"I hear you ca-a-alling me," warbled daughter from the parlor.

"Yes," sang mother from the kitchen, "I want you to come here and help me with the dis-s-shes."

And then a profound silence reigned.

There Are Others.

Teacher, to dull boy of the class: "Which New England state has two capitals?"

Boy: "New Hampshire."

Teacher: "Indeed! Name them."

Boy: "Capital N and capital H."

Explicit.

"Are you of the opinion, James," asked a slim-looking man of his companion, "that Dr. Smith's medicine does any good?"

"Not unless you follow the directions."

"What are the directions?"

"Keep the bottle tightly corked."

Spoilsport.

"Young man," said the magistrate, severely, "the assault you have committed on your poor wife was most brutal. Do you know of any reason why I should not send you to prison?"

"If you do, your Honor," replied the prisoner at the bar, hopefully, "it will break up our honeymoon."

Ever Feel That Way?

"I have a hard time getting my new hired man up in the morning," said one farmer to another as they met in the blacksmith shop.

"This morning I called him and said: 'Jim, don't you know the alarm clock has gone off?'

"He answered: 'Yes, I do, and I hope it won't come back.'"

Nothin' Else But.

An English professor, who was traveling through the Kentucky hills, sought provisions at a mountain hut.

"What d' yo'-all want?" called a woman.

"Madam," said the professor, "can we get cornbread here? We'd like to buy some of you."

"Co'nbread! Co'nbread! did yo' say?" Then she chuckled to herself, and her manner grew amiable. "Why, if co'nbread's all yo' want, come right in, for that's jest what I ain't got nothin' else on hand but."

He'd Get Mo' Later.

Little Rastus had come to see if Miss Jane would give his mother "a little 'lasses."

"Why don't you say a little *mo*lasses, Rastus?"

"Why, Miss Jane, you don't nach'ly think I'm goin' ter say *mo*lasses when I ain't had none yit!"

A Little Succor

To the village clergyman's home there came one day a bouncing baby boy. Kind neighbors and members of his flock hastily gathered together a few dollars and presented the money to the proud but poor father.

So great was his gratitude that he decided to thank his congregation the following Sunday before beginning his sermon, and this is what the wondering congregation heard:

"Friends, I want to express my keen appreciation and gratitude for the timely little succor that came to my home yesterday."

Unobliging Hens.

Marie, the eight-year-old hopeful of a certain household, was seated at the breakfast table one morning. As usual, eggs were served.

Now, either Marie was not hungry or she had grown tired of the inevitable bill of fare, for very earnestly she lifted her eyes and exclaimed:

"I wish to goodness hens would lay something besides eggs!"

Sit on the Lid and Laugh.

Build for yourself a strong box,
  Fashion each part with care;
When it's as strong as your hand can make it,
  Put your troubles there.
Hide there all tho't of failure
  And each little cup that you quaff;
Lock all your heartaches within it
  And sit on the lid and laugh.

Tell no one else its contents,
  Never its secrets share;
When you've dropped in your cares and worries,
  Keep them forever there;
Hide them from sight so completely
  That the world will never dream half,
Fasten the strong box securely
  And sit on the lid and laugh.

THE GRADUATE.

"Has your boy landed a job yet?"

"Not yet. But he seems to be getting gumption."

"How so?"

"He has quit carrying his diploma around with him to show to prospective employers."—Kansas City Journal.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-SECOND YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXV. JANUARY, 1916. No. 1.

CURRENT COMMENT.

Catch that Cleveland call?

* * *

Preparedness is the by-word of the new year.

* * *

Let us make that N. B. M. A. convention both big and beneficent.

* * *

Are you prepared to go to the N. B. M. A. convention and the Complete Building Show?

* * *

Are you putting in new machinery and overhauling the plant in preparation for a busy run in the spring?

* * *

Statler has been making the hotel business famous and furnishing an inspiring example of business enterprise.

* * *

Promptness is an important asset in business, and one good place to practice it persistently is in answering correspondence.

* * *

What preparations are you making to boost the building brick game during the coming season? The chances are good and everybody ought to boost hard.

* * *

The N. B. M. A. is about the biggest, at the smallest cost for membership, to be found in the association world. If you are not already a member, get in—and get active.

* * *

It is well to mobilize the business army for foreign trade development, but meantime let us not overlook nor neglect the big field for business development at home. Build with Brick.

* * *

That starting of a little rough house about rough face brick should not result in ill feeling, but should lead to an earnest study of the real merits of any and every face-brick offering.

* * *

There is a difference between a dry pan and a wet pan, but both pan out clay for the brick machine.

* * *

Road improvement ideas keep drifting toward the brick-paved way, which is really the right way.

* * *

With clay piled on shale, and shale piled on coal, and coal piled on fire clay, that Brazil, Ind., territory certainly is an assemblage of material to do things in the brick business.

* * *

Have you and your competitor gotten together and prepared the way to get a fair price for your product during the year? If not, get prepared to eliminate cut-throat competition.

* * *

Be prepared to go to Cleveland for the full week of February 20-26, and also be prepared to take an active part in the deliberations of the convention's sessions. Going helps some, but taking an active part helps a lot more.

* * *

We want to see the brick man make a splendid showing at the Complete Building Show at Cleveland, for it is too good a chance at brick boosting to neglect, and it is a safe bet that lumber and other rival building material will spread themselves with good exhibits.

* * *

The N. B. M. A. is a get-together organization, and it is also a progressive organization which heretofore has concentrated a lot of its effort toward manufacturing methods and is now giving attention to the subject of boosting brick. Let us make this subject a strong feature at the Cleveland convention.

* * *

Perhaps every man in the trade will admit that the brick business should have an order of publicity in keeping with the magnitude of the industry and the quality of the product, but too many are inclined to wait for the other fellow to furnish the funds and see whether efforts put forth will prove satisfactory before getting into the game. Let us quit the waiting game and get busy.

A BIG, PROFITABLE INVESTMENT.

Convention going has come to be a habit in this country. A writer in the Saturday Evening Post says it is estimated that the American public spends as much every year in conventions as it does for automobiles—$400,000,000—which represents about 20,000 gatherings of one sort and another. These figures are enough to make us give thought and study associations and their actual results, that we may get good returns for our money. Money spent in attending and taking part in the deliberations of a properly conducted association is really an investment, and not an expense.

A BOOK OF DISTINCTIVE BRICK HOMES.

A distinctive book of distinctive brick homes has been issued by the National Building Brick Bureau of Indianapolis, which, in keeping with the building art of today, is colorful and attractive as well as useful. It portrays, in pictorial form, plans, sketches and descriptions of a group of six apartment houses, both modern and interesting, and also plans and sketches from architectural competition for ideal brick homes to cost $7,500. The designs in this group represent interesting examples of the conceptions of a dozen different architectural designers and the descriptions accompanying each picture and plan is interesting and valuable without being lengthy and tedious. The book is a work of art through and through, not only having the artistic element strongly displayed in plans and designs shown, but the printing is equally artistic. The book should prove a valuable addition to the library of any architect. The list price is $2.00.

PRICE AND PRODUCTION.

From present indications we are to have quite a building boom this year, and the brick industry should be able to make two records, one of price and one of production. Business has improved wonderfully on all sides and there has been noticeable a decided tendency toward more extensive building. So the spring building season should open with a rush, and the demand for brick, if it is properly exploited, be of sufficient volume that there will be no trouble whatever in getting a fair price.

We are already seeing some signs of efforts to get the right price for brick. The Greater New York Brick Company has furnished one example, and all around us we hear of the trade striving to set a price that is fair and to hold to it and to cut out the cut-throat competition and get down on a co-operative basis, to the end that we may all get fair returns for what we produce and sell.

The law of supply and demand is a traditional figure in the matter of price and production, and we generally find that where production exceeds consumption the price suffers. Last year furnished an example of this in the face brick industry, where it was claimed that the market requirements were short of the production and that the majority of plants were not able to sell the full output. This naturally resulted in some demoralization of prices in the face brick world.

Logically, production and price should be separate, though in actual business it is seldom that they are. The price of a product is founded primarily on its cost, and really should hold the same, whether the consumption is equal to the production or not. Indeed, it generally costs more to produce brick when running a plant at half capacity than when running full capacity. The highest order of efficiency is usually obtained at full capacity, consequently when the production is lowered a man should obtain full price or a little increase, to come out with the right kind of a profit from his business.

COST SHOULD GOVERN PRICE.

The trouble with face brick, and with common brick, too, for that matter, last year was not too much production, but too little consumption. Reducing the price didn't help the consumption appreciably, and it did hurt the producer, consequently nobody is benefited when prices are reduced under these conditions. What we need is to boost consumption. In a way, it will help boost itself this year, from present indications. These indications are strong enough that already there is a boom on in the lumber world. Lumber, like brick, suffered considerably last year, both in price and in volume, but along in the fall the tide turned and prices began to stiffen and the volume of demand to increase, and it kept this up until, before the end of the year, the price of common lumber at the mills in the south, practically doubled and the volume of business has increased almost correspondingly.

This sounds like good business for the next year, and good business for brick specifically, because it not only indicates a revival in the demand itself, but puts the price of lumber up. Brick, at fair prices, will enter in competition with lumber with more favors in the matter of first cost. There has really never been a time when brick had a better opportunity to make headway in competition with lumber and all other building material than will be offered this year. It naturally follows, therefore, that those interested in boosting the brick game should keep the exploitation end of it alive, to the end that they may considerably extend its uses.

Meantime the matter of price should be considered, both independent from and in connection with the possible demand. The basis for price should originate entirely apart from the volume of demand and be founded upon the cost of production. From this basis the trade should figure out the price in each locality that will insure a fair return and profit at anything from half capacity to full capacity. Then set about getting that price or something better. With the volume of demand such as to consume the full capacity or more, the brick man has his opportunity to get a little better price and lay aside an additional profit as a safeguard against the lean years that may come later.

The year 1916 should prove a big year in the brick business, and we hope to see two new records made, one of production and one of price, and also we feel from present indications that the year will prove one of the most prosperous in the history of the industry.

THE POWER OF REPETITION.

One of the things that fits in mighty nicely in the campaign that has been waged by The Clay-Worker for the persistent and continued use of the "Build With Brick" sign is a leading editorial appearing recently in the Evansville Journal-News, one of the newspapers in which those enterprising brick boosters of the Standard Brick Manufacturing Company at that place use for part of their advertising campaign.

The editorial starts off with the assertion that there is no power on the human mind as great as the power of repetition, and follows it with citations of instances of the effect of repetition, pointing out that the Mohammedan and other religions show an understanding of the power of repetition in their educational methods, requiring poor children, day after day, hour after hour, to recite the Koran. They are stupid and brutalized, but they know the Koran because repetition gets it into their heads.

Political parties, men who advertise, those who teach good habits to the young, learn that the one great force is repetition. The wisdom of ancient peoples lives in proverbs, easily and constantly repeated, and the courtship which culminates in marriage consists largely of a repetition of the same sentence many times. It may sound dull to others, but it brings results. The mountains are washed down by the snow falling and melting, by rocks spreading and crumbling every day, every hour, for millions of years.

USE THE BUILD WITH BRICK SLOGAN.

The point is well taken that brilliancy, wit or great variety cannot possibly serve the purpose of repetition. The thing to do is to find out what word, phrase or implement you may need to accomplish a certain result, and use it—use it repeatedly. The man who shapes iron and other metals into many different forms does so by persistent repetition of blows with a hammer. It is the continual hammering at it that does things.

That's the way it is with this "Build With Brick" proposition. What we need to drive it home and get startling results is continued repetition, to keep hammering and driving at it, to keep putting up the signs so that they stare the public in the face persistently day after day, until they make an impression that is irresistible.

To just feature this injunction once a year or inaugurate one big campaign with it and stop is not the way to get the great results. Keep everlastingly at it. That's the thing. Use the power of repetition and hammer away continuously. That is one reason why we are persistently repeating these little articles and injunctions about the use of the "Build With Brick" signs, to keep impressing the trade with their importance, to get the power of repetition.

We want the trade to take up the same idea and use it, to keep posting up "Build With Brick" signs, to keep printing the slogan in the newspaper, on stationery and everywhere, and not make the mistake of feeling that they have already done a good job and there is no need to repeat it or to carry the work further.

Make the campaign of "Build With Brick" posters and signs bigger and better this year than ever before. All we have to do is to keep it up long enough. It has already proven to be the biggest thing undertaken, but the good already accomplished is but a small measure as compared to results that may still be obtained by keeping everlastingly at it.

THE SWIFT KILN AND DRYER.

Readers of The Clay-Worker who are considering improving their drying system or those who wish to reduce their fuel bills, and their name is legion, or should be, will be interested in the announcement on page 96 of this issue relative to plans for the Swift Slack Coal Burning Kiln and the Swift Hot Floor Dryer.

A USEFUL SOUVENIR.

The M. D. Valentine & Bro. Company, manufacturers and dealers in fire brick and fire clays, cupola linings, etc., recently celebrated the fiftieth anniversary of their firm, and sent to their friends a souvenir of the occasion in the form of a miniature glazed brick for use as a paper weight. It is doing duty in that capacity on the editor's desk, and is a pleasant reminder of a friendly business relation of many years' standing.

THE BONNOT COMPANY'S SOUVENIR.

We are indebted to The Bonnot Company, Canton, Ohio, manufacturers of brick, tile and sewer pipe machinery, the built-for-service sort, for a very handy memorandum book, which contains a surprising amount of statistical information. One page is devoted to terse information under the head, "First Aid to the Injured." While they do not say so in the book, nor in their ad on page 3, we presume they can conscientiously recommend Bonnot machinery as one of the essential first aids to a substantial bank account at the end of the season. Also presume a copy can be had for the asking.

KILN BANDS, KILN LUGS, RODS, ETC.

For a number of years past, many of the brick and tile manufacturers of Indiana and Illinois have purchased their kiln bands and similar materials from W. J. Holliday & Co., Indianapolis, and have found that in service, price, and quality of materials that firm has met every reasonable requirement. As will be seen by their ad on page 951 of this issue, they are prepared to furnish supplies of this sort to the clay trades, and will be pleased to submit quotations for anything in that line. Among the clayworkers whom they have supplied with kiln bands, etc., during the past season are the Standard Brick Co., Crawfordsville, Ind.; the Danville Brick Co., Danville, Ill.; the Hydraulic Press Brick Co., Brazil, Ind.; the Poston Paving Brick Co., Crawfordsville, Ind.; F. R. Carter, Peoria, Ill.; the Indiana Paving Brick & Block Co., Brazil, Ind., and the Clay Products Co., Chicago, Ill., all of whom are satisfied users, which is generaly conceded to be the best advertisement.

SOMETHING NEW FOR CLAYWORKERS.

As the reader may learn by turning to his ad on page 99 of this issue, Mr. E. R. Stowell, Oden, Mich., has perfected a carbide coating for kilns and furnaces which, it is claimed, saves a very large per cent. of the heat from being lost by radiation, as is common under ordinary conditions. Mr. Stowell will be glad to "show our Missouri" patrons, or any one else connected with the brick and tile business that they can save money by the use of his Carbide Coating, which is also used as a preservative in coating dryer cars, etc.

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"GETTING THE MOST FOR A DOLLAR,"
has been given as a definition of good engineering such as is done by
The Richardson-Lovejoy Engineering Company.
[See page 114.]

A REMARKABLE CHRISTMAS GIFT.

The Farr Brick Company, of Cleveland, surprised nearly one thousand of their customers with a remarkable and wholly unexpected Christmas gift in the form of stock certificates. The total distribution amounts to some $25,000 and made on a basis of 3 per cent. of the value of purchases of brick made from the Farr Brick Company during the past year. The Farr Brick Company is a $3,000,000 corporation, one-half of which is common stock and one-half preferred stock. The stock distributed was of the latter class entirely. In commenting on the incident, Mr. Robert C. Mitchell, sales manager of the Farr Brick Company, said, "We have sent our patrons our Christmas greetings, accompanied with the announcement of our incorporation and notification that they are to share in our profits, though no promises were made to them during the past year that this would be done. They gave us their patronage, and we are sending back to them a three per cent. Christmas present."

Stopping an advertisement to save money is like stopping a clock to save time. Advertising is an insurance policy against forgetfulness. It compels people to think of you—Michigan Manufacturer and Financial Record.

BUILT RIGHT
RUN RIGHT

1916 1916

We extend Greetings to the Clayworkers of the United States and wish them a "Prosperous New Year."

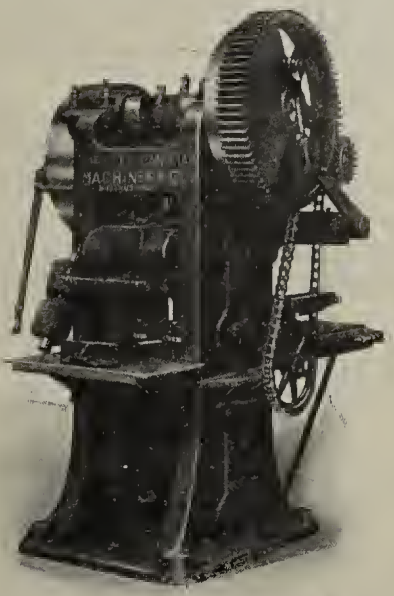
We not only "wish" you prosperity, but we want to introduce to you a few representatives of our line which will help you to MAKE prosperity.

These machines are not in the cheap class—they are built up quality and will help you "Make and Save"—make more and better products and save delays and repairs.

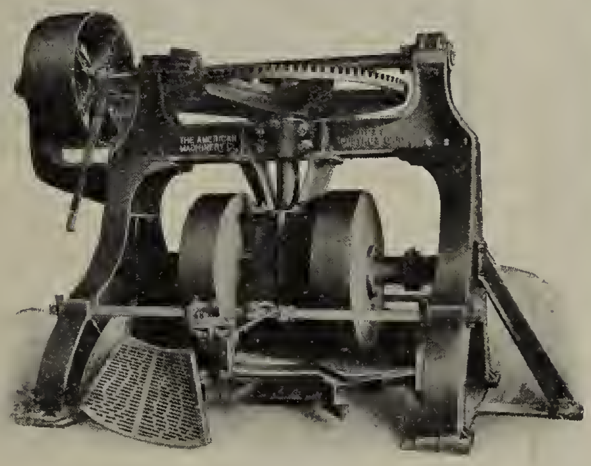
Permanent economy in machinery is better than a temporarily cheap price. These machines are built for permanent profits and permanent friendship of customers.

We offer our best services to the Clay Trade either in a machinery or advisory capacity.

Send for Bulletin 96, just out. 250 pages.



American No. 292 Repress.

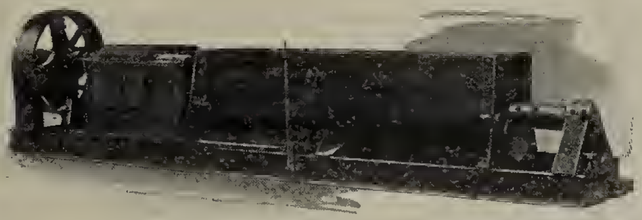


American No. 57 Dry Pan.

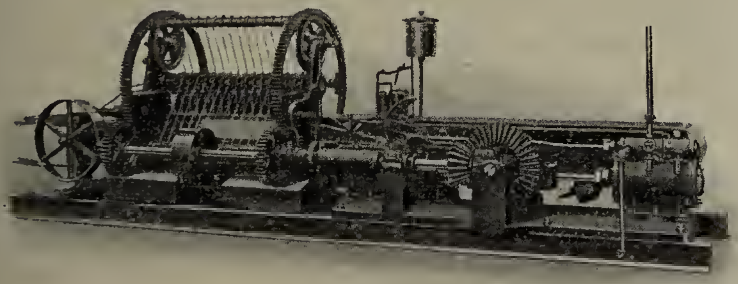
Haigh Continuous Kiln.

The American Clay Mach. Co.

Bucyrus, Ohio,
U. S. A.

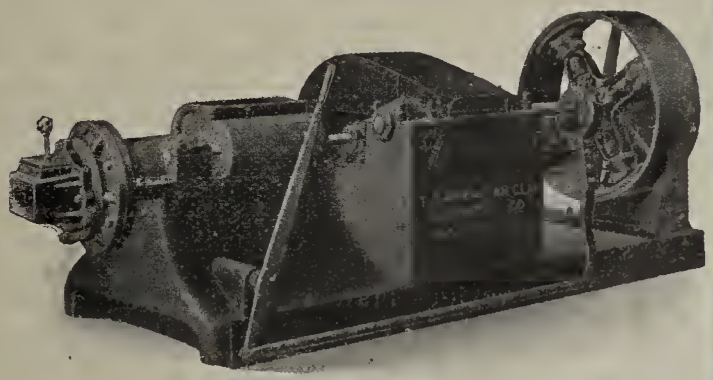


American No. 304 Pug Mill.

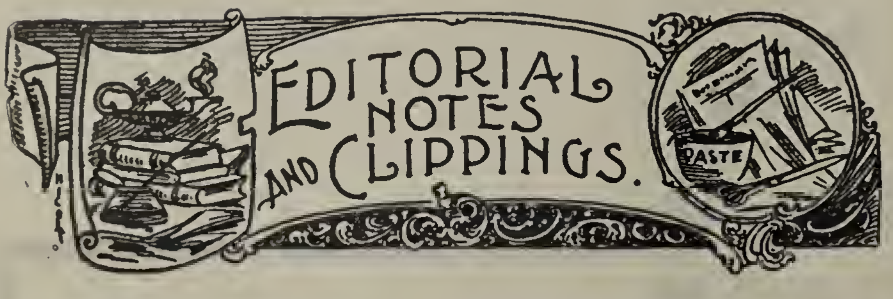


American No. 300 Rotary Automatic Cutter.

Much the
Largest
and Best
Line of
Clay-
Working
Machinery



American No. 233 Auger Machine.



EDITORIAL NOTES AND CLIPPINGS.

The Wallaceburg Brick Co., Wallaceburg, Ontario, Canada, will install new machinery.

E. B. Wentworth is interested in a new brick plant to be established at Oklahoma City, Okla.

Frank E. Nicholson is at the head of a company that will build a 100,000 daily capacity brick plant at Henryetta, Okla.

The Farr Brick Company, of Cleveland, Ohio, has taken out a permit to build an additional kiln, at an approximate cost of $10,000.

It is rumored that the Los Angeles Brick Company will shortly move its plant from Los Angeles, Cal., to Alberhill, where it will build a modern industrial city.

The brick plant at Ft. Scott, Kans., which was burned some time since, is being rebuilt. M. M. Bushong, the manager of the plant, has charge of the construction work.

A. J. Budd has purchased the plant of the Shellsburg (Iowa) Brick & Tile Works. The plant was not in operation last year, but Mr. Budd will put the plant in operation at once.

B. A. Bounds is interested in the establishment of a fire brick plant at Annville, Ky. There has been an unusual demand for fire brick recently, owing to the activity in the steel, iron and allied industries.

The plant of the Wisconsin County Brick Co., located at Bridgeport, Texas, was sold recently to Judge Simmons for $20,000. The plant at one time was a profit-paying concern, but several years of bad business caused a forced sale.

Mr. and Mrs. Joseph Spang, of Reading, Pa., celebrated their golden wedding anniversary December 26, and at the same time Mr. Spang celebrated his fiftieth anniversary in the brick business, and also his retirement from active management of the brick company.

A. R. Lucas, of Houston, Texas, writes that while he has been making a soft-mud hand-made brick, he intends to build an up-to-date dry press brick plant and so is in the market for a four-mold dry press machine, boiler, pulleys, crusher, etc. He will burn his brick with crude oil.

H. W. Caldwell & Son Co., Chicago, Ill., opened a sales and engineering office at 711 Main street, Dallas, Texas, January 1, which is in charge of J. C. Van Arsdell. By the establishment of the Dallas office, the company expects to give better service that heretofore to their patrons in that field.

For the past two years the P. Bannon Pipe Co., Louisville, Ky., have been rebuilding and enlarging their sewer pipe kiln. The type of kiln selected by them has surpassed all expectation in the perfectness of glaze and quality of ware at every point in the kiln. The company are therefore ready for and expect large business in 1916.

The Summit Brick Company, of Pueblo, Colo., on account of the prosperity of the last year, is making extensive plans for the enlargement and improvement of their plant. New machinery and kilns will be installed for the making of fireproofing, building tile, cushion tile, drainage tile and brick. The management states that the increase in business in 1915 amounted to 50 per cent over the same length of time in 1914, and that the outlook for the coming year is more promising than ever.

Seventy-five prisoners are at work at the Junction City (Ohio) brick plant of the state, turning out from 20,000 to 25,000 brick every day, which will be used in the erection of buildings at the various state institutions under the management of the board of administration. More than 3,500,000 brick are now ready for shipment and orders placed with the board mean all-winter work for the prisoners at the brick plant. Plans of the administration board are for the making of paving block which will be stamped "prison made" and offered on the open market to contractors for highway improvement. While there is a legal question about the board being able to dispose of the brick to contractors without being marked, there is a constitutional provision which eliminates any question when the brick are properly stamped.

T. J. Snyder, proprietor of the Snyder Brick Co., Lima, Ohio, writes that he is in the market for some brick machinery.

The Paducah Clay Company, of Paducah, Ky., has increased its capital stock from $4,000 to $12,000 for the purpose of improving the plant.

Eli W. Fox, of the Reading Terra Cotta Works, Reading, Pa., died at his home in that city, December 14, following a short illness, which culminated in pneumonia. He is survived by a wife and two children.

A charter has been issued to the DuBois Clay Manufacturing Co., of DuBois, Pa. The incorporators are A. S. Moulthrop, S. J. Schrecongost and H. E. Bauer. The company manufactures furnace linings and other special clay products.

Joseph Pedro, thirty-five years old, was instantly killed while working at the Flint brick plant in Highland Park, Des Moines, Iowa. Pedro was employed near a clay crusher. He fell into the crusher, and before the machinery could be stopped the entire top of his head had been taken off.

W. T. Christopher has put the East Gadsden Brick Plant, at Gadsden, Ala., into operation for the first time since 1913. About thirty men will be employed. The demand for brick has been increasing steadily and Mr. Christopher expects to keep the plant running full handed for some time to come.

Mayor W. J. Mayes, of Knob Noster, Mo., and J. W. Millar have purchased an interest in the Knob Noster Brick & Tile Company. Mr. Mayes has been made president of the company and Mr. Millar will be general manager. Among recent contracts booked by the company is one for 3,000,000 brick for the new capitol building at Jefferson City, Mo.

Undaunted by what was generally known as a "poor" season, the Bessemer Limestone Co. is running its paving brick plants at Bessemer, Pa., and Youngstown, Ohio, to full capacity, in anticipation of a good spring and summer business. The company expect to have about 20,000,000 paving brick in its stock pile by spring and to dispose of every one before the season is over.

W. E. Dunwody, president of the Standard Brick Co., Macon, Ga., is accustomed to receive inquiries and orders from various parts of the United States for brick, but during the last few months the company has had inquiries for brick from Bombay, India; Paris, France, and Piraeus, Greece. The latter inquiry stated that they could obtain the brick desired from England but the writer preferred to deal with American firms.

A. S. Reid & Company, Inc., has sent out cards announcing that the business formerly conducted in Philadelphia under the firm name of A. S. Reid & Co., has been taken over and will be continued in the Morris building, Philadelphia, by a new corporation known as A. S. Reid & Co., Inc. The officers of the new corporation are: A. S. Reid, president; James T. Reid, vice president; James Tongue, treasurer, and W. H. Gaul, secretary. With such a combination of "Tongue" and "Gaul," the company will surely achieve success.

The Warrenton Clay Products Company has been organized at Warrenton, Ore. The officers are: President, George W. Warren; vice president, George Chew; secretary and treasurer, E. P. Smiley, and general manager, Warren Overpack. The company has been incorporated at $125,000, and work on the plant will be started at once. They expect to manufacture sewer pipe, hollow tile, building block, conduits, flue linings, etc., as it has been found through tests that the clay owned by the company is especially adapted to the manufacture of sewer pipe and other clay products of this nature.

In a recent interview in the Pittsburg (Pa.) Post, Thomas E. Wilson, of the Pittsburg Clay Products Co., is quoted as follows: "I can say that we have had a very fair and normal year in the building brick industry throughout the year just closing. The prospects for the coming year are excellent. December is bringing many inquiries of such a nature as to forecast strong business for 1916. It is true that some brick plants in the Pittsburg district have not been fully occupied at all times during 1915, but considering the general business conditions which followed the war, I think we have done very well and have no cause for complaint. The indications are that 1916 will be a big year for building construction. General business conditions are getting better rapidly and brick will be in demand. We have placed all of our plants in good

(Continued on page 92.)

Barrett's PAVING PITCH

Rockingham Road, Davenport, Iowa. Brick pavement filled with Barrett's Paving Pitch.

A Brick Pavement that is Quieter

THE noisiness of brick pavement is to many property owners a great objection. This objection, however, is based primarily upon pavements the joints of wich are filled with cement rather than with Paving Pitch.

The use of Paving Pitch for the joints largely overcomes this objection of noisiness.

Pitch is a non-conductor of sound. The pitch filled pavement does not echo and ring the way a cement filled pavement does, as the sound of the blow of a horse's hoof will not pass from brick to brick when every brich is surrounded with plastic, elastic Paving Pitch.

Cement filler transforms the brick into a single monolithic sounding board, whereas with Pitch Filler the only noise is that of the horse's hoof upon the single brick which it happens to be striking. This is very noticeable in cases where a cement filled pavement adjoins a Pitch filled pavement—when a wagon passes from one to the other there will be a noticeable change in tone, the Pitch filled pavement being decidedly quieter.

Pitch also is better than cement as a filler because it provides adequately for the expansion of brick in hot weather.

Booklets free on request. Address our nearest office.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria
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EDITORIAL NOTES AND CLIPPINGS—Continued.

shape and have added a number of kilns at some in order to be able to meet demands."

H. B. Clark and others have organized the Summit Brick Company, of Summittville, W. Va., with $150,000 capital stock.

The Kennedy Refractories Company has recently been granted a charter at Lancaster, Pa. Those interested are H. A. Kennedy, R. J. Landis and I. B. Engle.

The Fulton Brick & Mining Company was recently incorporated at Columbus, Ohio, by Frank E. Mohr, J. B. Myers, L. R. Detwiler, George P. Mohr and George E. Plymire.

Charles F. Clippert, of the George H. Clippert & Brother Brick Company, was recently elected president of the board of fire commissioners of Detroit, Mich., a position which he is eminently well qualified to fill.

The plant of the Beaver Clay Company, at New Galilee, Pa., has an addition under course of construction which will give it an annual output of 35,000,000 building brick. The prospects for the coming season are unusually good.

The Illinois Brick Company declared a dividend of 3 per cent January 15, payable to stockholders of record January 5. The company has had a very good year, despite strikes and labor troubles, and the prospects are bright for an unprecedented business the coming season.

U. A. Cotte, owner and manager of the St. Anne Brick & Tile Co., St. Anne, Ill., presented each of his employes with a duck for their Christmas dinner, and was given a surprise when the employes in turn presented him with a gold watch as an expression of the high esteem in which they hold him.

J. E. Whiteselle, a well-known citizen and brick manufacturer of Corsicana, Texas, died at his home, December 31, after an illness of a week. Mr. Whiteselle owned the controlling interest in the Whiteselle Brick & Lumber Company. He was sixty-four years old and had lived in Corsicana since he was a young man. His wife survives.

John Hooper, Sr., a prominent brick manufacturer of Pittsburg, Pa., died at his home there recently. Mr. Hooper was seventy-six years old and had been a resident of Pittsburg for over sixty years, most of which time he has been engaged in the manufacture of brick, under the firm name of Hooper & Sons Company. Six sons and one daughter survive.

At the annual stockholders' meeting of the Alliance Brick Co., Alliance, Ohio, reports read showed a gain of 61 per cent in sales over the previous year. The company's product was shipped as far south as New Orleans and as far north as Montreal, Canada. The capacity of the plant was increased 75 per cent. The old board of directors was re-elected, as follows: R. M. Scranton, W. H. Purcell, E. L. Guthrie, J. A. Jones, W. E. Dunning, L. W. Lewis and F. A. Hoiles.

Henry Brunt, general manager of the Edwin Bennett Pottery, of Baltimore, Md., died at his home in that city. Death was due to anemia, from which he had been ill for some time. A short time before his death he underwent an operation for blood transmission in which his daughter gave her blood. There was a slight improvement for a time, but later he suffered a relapse. Mr. Brunt was a pioneer in America in the handling of high-class pottery, having been engaged in the invention and manufacture of pottery all his life. He is survived by five children and six grandchildren.

Theodore W. Wolters, manager of Wolter Brothers, brick manufacturers, Atchison, Kans., died December 12. Mr. Wolters had been ill for two months with rheumatism and a few days previous to his death pneumonia developed. He died in the house where he was born forty-seven years ago. His father, John Wolters, established the brick business, and when the son was old enough he became associated with his father, and assumed the management of the plant a few years ago when his father retired. A wife and eight children survive.

The plant of the Golden-Fairview Pressed Brick Company, at Golden, Colo., was totally destroyed by fire which started at an early hour December 21, entailing a loss of about $30,000. The manager of the plant, James C. Knox, of Denver, is at a loss to account for the cause of the fire. It started in the engine room. The plant was only partly covered by insurance. A high wind was blowing when the fire started and in a very few minutes the buildings were a mass of cinders. The brick plant has been one of the leading industries of the state and is owned by the Golden-Fairview Pressed Brick Company, with headquarters in Denver.

At a trustee's sale held recently, S. A. Mundy, of Bradford, purchased the plants of the Foster Brick Company at Bradford, Binghampton and Youngsville.

The Fallston Fire Clay Company is erecting an addition to its plant at Fallston, Pa., which will give it a capacity of 28,000,000 per year. This company recently purchased the plant of the Fire & Face Brick Company, at Eastville.

Edward A. Shepherd, a prominent citizen of Columbus, Ga., and member of the well known brick manufacturing firm of Shepherd Bros., of that city, died January 12, following a short illness.

The Savannah Kaolin Company has filed incorporation papers at Savannah, Ga., to engage in the mining and marketing of clays, ore, etc., at Gordon, Wilkinson county. The company is capitalized at $500,000.

The brick plant of James Florey, at Roslyn, Pa., was burned the latter part of December, and after the fire had been extinguished, the charred body of a man was found in the ruins. It is supposed to have been a tramp who had taken refuge from the cold.

Charles Lesher, general superintendent of the Harbison-Walker Refractories Co., of Pittsburg, with plants at Phillipsburg, Retor, Wallaceton, Woodland, Clearfield and Stronach, Pa., announced January 1 that the wages of all the employes will be increased February 1. The advance will vary as to grades of work and will affect every plant owned by the company.

Every employe of the Thornton Fire Brick Company, at Thornton, W. Va., received a turkey the day before Christmas, and had two holidays over Saturday and Sunday. Marion Blair, the superintendent of the company, says their business is good and booming, and the company is looking forward to one of the most prosperous years in their history. D. R. Potter, of Clarksburg, W. Va., is general manager of the company, with general offices at Clarksburg.

TRADE ANNOUNCEMENTS.

The new year brings announcements of a number of changes in the clayworking world. W. D. Richardson, for a number of years general superintendent of the Claycraft Mining & Brick Co., Shawnee, Ohio, severed his connection with that company in order to engage in business for himself. It is rumored that he will make Columbus, Ohio, his place of business.

Canton Clay Products Co., Robertsville, Ohio, capitalized at $75,000, will build a large plant. C. A. Bourgouis is manager.

The American Enameled Brick & Tile Company has sent out a neat folder announcing the removal of their offices to the third floor of the Vanderbilt Concourse building, 52 Vanderbilt avenue, New York City, and showing an illustration of the building. The company also announces that the newly organized Hay-Walker Company, with adjoining office, will be the selling agents of the American company in the Metropolitan district. Messrs. Andrew A. Ayres and William C. Black, formerly of Carter, Black and Ayres, are now associated with the Hay-Walker Company.

The Dunn Wire-Cut-Lug Brick Company, of Conneaut, O., has had two prominent additions to its family of licensees, the Burton-Townsend Company, of Zanesville, O., with two plants and a present daily capacity of 160,000 pavers, and the Trimble Paving Brick Company, of Dayton, O., with one plant at Trimble, O., and another at Glouster, O. These two companies are among the largest and most prosperous in Ohio. The Thornton Fire Brick Company, Clarksburg, W. Va., with plant at Thornton, W. Va., is another licensee which will manufacture the Dunn Wire-Cut-Lug Brick.

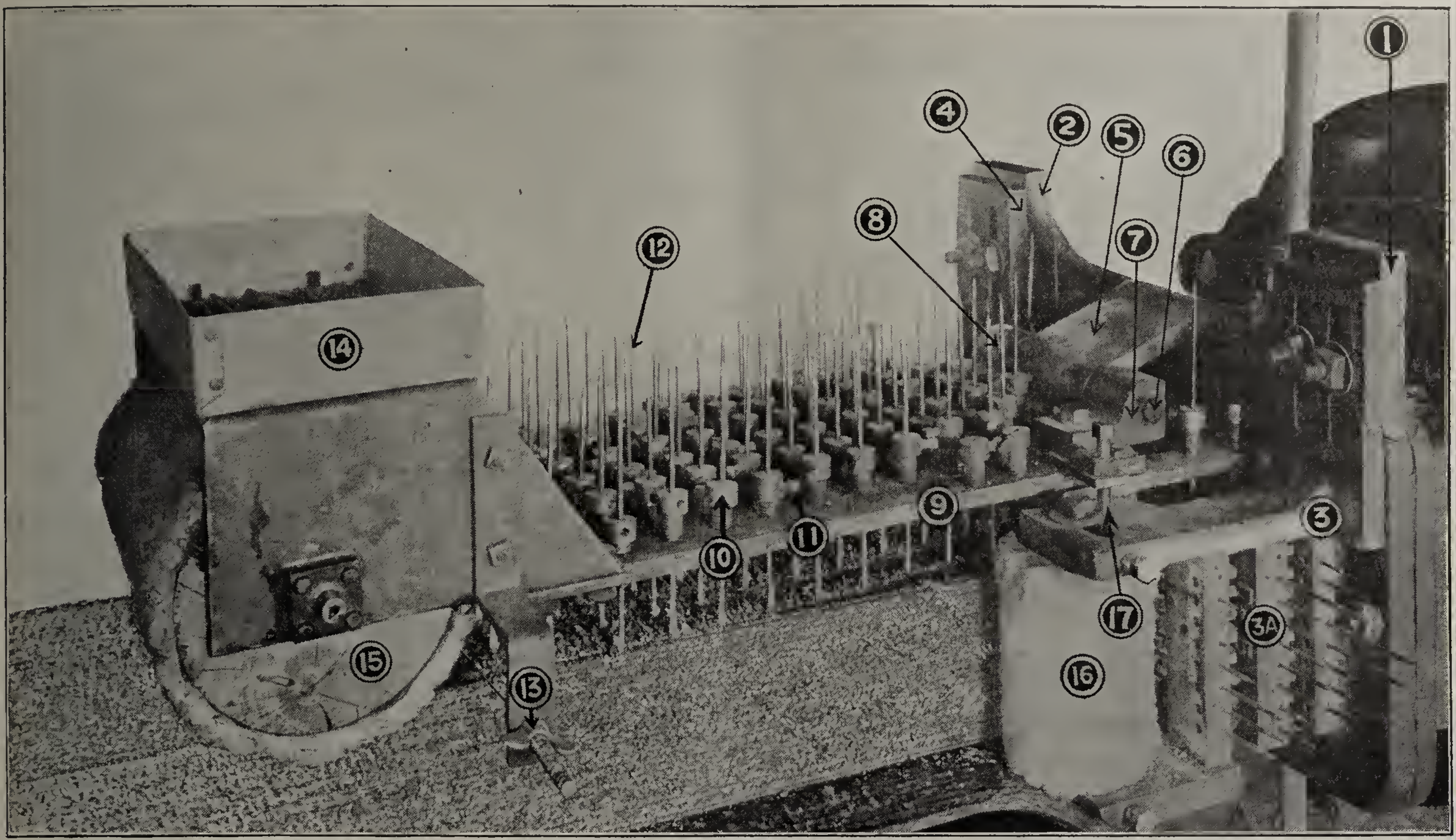
In addition, the Deckman-Duty Brick Company, of Cleveland, O., another Dunn licensee, has consolidated with the Wooster Shale Brick Company, of Wooster, O., under the name of the Medal Paving Brick Company. This adds one more plant to the three which the Deckman-Duty Company owned—one at Cleveland, O., one at Carrollton, O., and one at Malvern, O.

These accessions give the Dunn Company twenty-nine licensees, operating forty-six plants.

Machine for Making RUG Brick

Patented in U. S. and Canada by D. E. REAGAN, Assignor to

Hocking Valley Products Company, Columbus, Ohio



U. S. PATENTS

No. 1,100,989	On Machine.
No. 1,101,093	On Method.
No. 46,580	On Design.
No. 1,118,681	On Brick.
No. 102,686	Trade-Mark registered on name RUG.

CANADIAN PATENTS

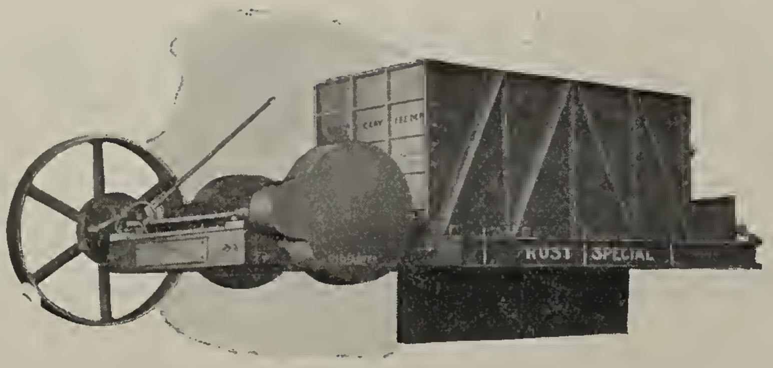
No. 157,727	On Machine.
No. 157,728	On Method.
No. 157,928	On Brick.
No. 82	Trade-Mark registered on name RUG.

To the twenty-five bona fide manufacturers of RUG brick a Happy New Year!
To those also who are making Imitation RUG brick without license, a Happy New Year!
"Imitation is the sincerest form of flattery."
We shall, however, demand a reckoning from all unlicensed manufacturers.
Don't be a pirate, when it costs so little to be a good fellow.
RUG is the most popular and profitable brick in the world. We made it so.
It was formerly difficult for one of our licensees to get $8.00 for his shale brick.
But since he began making RUGS it is difficult to fill his orders at $12.00.
Let us help you to increase your sales and profits as we have others.
Write for license for 1916, which will be the banner building year.

Rugfully yours,

Hocking Valley Products Company

D. E. Reagan, President
COLUMBUS, OHIO



The Rust Clay Feeder

is a machine with a purpose. It is used not only for **efficiency**, but for decided **economy**—saving you upwards of $500.00 a year in your clay plant. While it saves you real money, it also permits a more uniform mixture of your material and therefore improves your product.

You may dispense with something else, but not with the Rust Clay Feeder—it is indispensable. Shall we send you more evidence?

Marion Machine, Foundry & Supply Co.
Marion, Indiana
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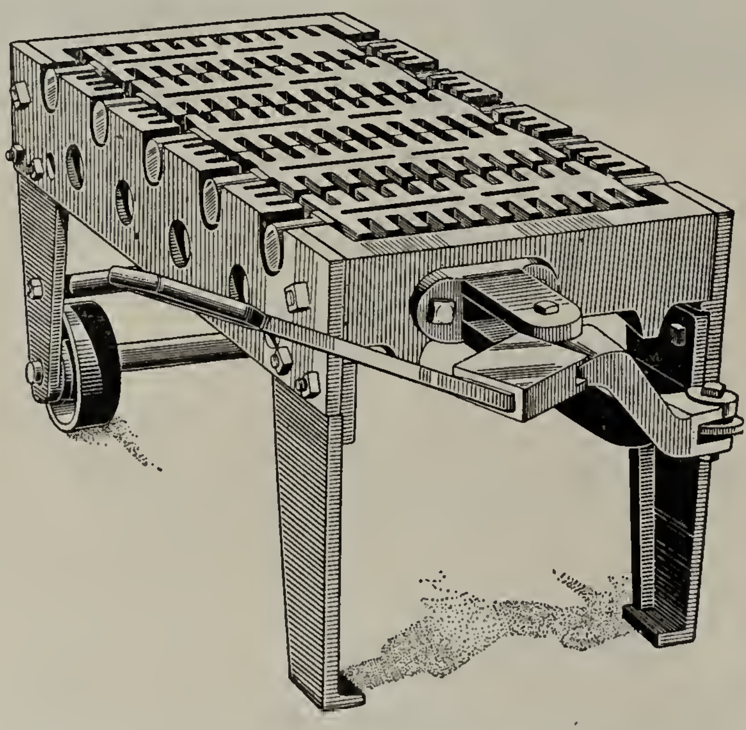

The Keystone Portable Kiln Grate

will fill a want in many tile and brick plants. Made either with or without wheels.

Marion Machine, Foundry & Supply Co.
Marion, Indiana
P. O. Box 156.

THE BURNING OF FACE BRICK IN DOWN-DRAFT KILNS.

(Continued from page 36.)

The case of clays low in lime and of sufficient iron content to cause red coloring is the simplest of all. If an even red shade is desired throughout the kiln, an even temperature with a continuously oxidizing atmosphere must be produced, for an increase in temperature means a darkening of color, and reduction followed by oxidation has the effect of making the color dull except in the presence of sulphur, when a brightening is noticed, accompanied sometimes by a violet tinge such as is seen in the polychrome brick so popular at the present time. Where the iron content is not sufficient to produce a strong red color reduction in the presence of sulphurous gases followed by oxidation is effective in darkening and intensifying the red color.

The production of the many shades of modified red which are now used so extensively in rough texture brick is dependent upon an accurate knowledge and control of the action of reducing gases. These are effective only in the finishing stages of the burn, hence in this class of ware the color is almost entirely determined in the last few hours of firing. The duration and intensity of the reduction as well as the degree to which vitrification has progressed in the ware are determining factors in the result. For every dark brick, including brown, green and blue shades, a long period of reduction at the last stage of firing followed either by cooling in a reducing atmosphere, such as is practiced in producing the blue clinkers of Staffordshire, or a quick cooling in an oxidizing atmosphere is necessary. The latter course has the advantage of a saving in time and facility of operation, but the brick lose something of their color during the cooling, as reoxidation takes place readily at the high temperature at which the brick are exposed to the air. In the production of brick ranging in color from red to violet, through the blues, greens and browns with red centers and dark borders, the greatest care and skill of all is needed to produce successive kilns alike. The only sure way of accomplishing this is to keep effective records of every condition pertaining to the working of the kiln, together with time schedules and complete description of processes. The main feature is to obtain just the right amount of reduction at the end of the burn to carry the flash part way to the center, the brick of course being faced in the setting, and then to control the reoxidation of the outside through the rate of cooling. It is in this kind of work more than any other that full-sized draw trials are essential, as they alone can indicate the progress of the chemical reaction taking place within the kilns.

A fuller treatment of many of the points brought out above may be found in the following works, to which the writer has referred both for information and as a check upon his own experience: "The Collected Writings of Herman August Seger," "Technology of Clays," by S. W. Beyer and I. A. Williams, in the annual report for 1903, Vol. XIV of the Iowa Geological Survey; "The Pyro-Physical and Chemical Properties of Paving Brick Clays," by Ross C. Purdy, in Illinois State Geological Report for 1908; Bulletin No. 9, "The Status of Carbon, Iron and Sulphur in Clays," by Prof. Edward Orton, Jr., and Homer F. Staley, in a report of the Committee on Technical Investigation of the N. B. M. A.; a paper read before the American Ceramic Society by Walter A. Hull, entitled "On the Burning of Rough Texture Shale Brick," and published in Vol. XVI of the transactions of that society; "Notes on Flashing," by A. V. Bleininger, published in Vol. II, and "The Effect of Over-burning Upon the Structure of Clays," by A. V. Bleininger and E. T. Montgomery, published in Vol. XV of the same transactions.

There are a number of types of fuel available for face brick burning. The more important of these are coal, bituminous and anthracite, oil, and gas, natural or producer. With the latter the writer has had no experience, and hence will not attempt to discuss it except to say that it is probably the most easily controlled of all the fuels and bids fair in the near future to become a more important factor in ceramic firing.

Bituminous coal is by far the most widely used fuel, and a brief consideration of its properties and the methods of burning it may not be out of place. While excellent for heating up and finishing, it is not well adapted for drying off, as its smoke is apt to settle on the moist ware and choke up the draft spaces, while its sulphur content is dangerous for clays with scumming proclivities. Wood or coke is much better for this purpose, though in some cases anthracite coal is successfully used. The average volatile content of bituminous coal is from 15% to 40%. It is this part of the coal which gives the long flame and at times the reducing fire. In placing fresh dry coal upon a white hot fire the volatile gases may be distilled off so rapidly that it will be impossible to oxidize even a fair proportion of them for the first few minutes, therefore a method of firing should be pursued which will tend to minimize this action. In furnaces with horizontal grates, the fuel bed should be kept thin and the charging of coal be light and often. Great care is required that no large holes burn through the fire to admit cold air to the kiln. Many devices for coking or distilling the coal before placing it on the fuel bed have been tried, but the writer has yet to see one, the advantages of which can be conclusively proved. Some burners make a practice of placing the fresh coal on the dead plate in front of the grates and pushing it back after coking is completed. This puts extra work on the men, but has some advantage in the way of smoke prevention. Generally speaking, the fires should be disturbed as little as possible, for poking and stirring will decrease the heat and induce the formation of clinker.

The inclined grate bar or basket type furnace has many advocates because of its simplicity, low cost and ease of firing. Properly managed it will give as good results as the horizontal type and will maintain an oxidizing fire even better than the latter, but it is not quite as economical of fuel. In this furnace the fresh coal is placed at the top of the slope and distills gradually as it works down to the hot part of the fire. The air supply is regulated entirely by the opening left between the coal and the arch over the furnace. This arrangement causes the inrushing air and the distilled volatile matter to pass under the arch and over the hottest part of the fire together, insuring combustion. Cleaning a fire in this type of furnace is very simple, as the bars may be easily removed, thus giving free access to the clinker which is mostly in front of the fire and not under it. These are the chief advantages of this style of furnace. The disadvantages are that the hottest part of the fire is generally too thick for economical combustion and that economical regulation of the air supply over the fire is difficult to attain.

A modification of this type has a sloping plate or series of steps of fire bricks in place of the grate. The brick becoming hot serve to hasten coking. This is a simple and durable furnace and works well if properly used.

A third type which is adapted only to the burning of wares which are not harmed by reduction is the grateless or solid bottom type. This has an arched opening in front at the bottom for the admission of air and the removal of ash, and a hole in the top for feeding. Its chief virtue is its low cost to build. It lacks the economy of operation of the other two types.

Forced Draft.

Forced draft applied to kiln furnaces is a decided advantage. It not only frees the kilns of wind influences, which often cause one side to heat up faster than the other, but what is more important, it relieves them of the burden of inducing draft for the furnaces. This means that a more uniform condition of gas pressure may be maintained throughout the kiln, hence a more even burn. In any down-draft kiln the fire gases

(Continued on page 96.)

SCUMMING AND EFFLORESCENCE

BY

ELLIS LOVEJOY, E. M.

This is the finest treatise on the subject ever written. Every angle of the cause and best method of overcoming the scumming and efflorescence on brick is given in detail.

ONLY 50 CENTS THE COPY.

T. A. RANDALL & CO.
INDIANAPOLIS, - IND.

IRON & STEEL

KILN BANDS,
Steel Plates, Bars,
Reinforcing Bars,
Shafting, Bolts,
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Indianapolis, Ind.

1916 ANNOUNCEMENT

We want a SWIFT SLACK COAL BURNING KILN and a SWIFT HOT-FLOOR DRYER in your vicinity. If there are none—to the first one answering this ad we will furnish one or both PLANS at a cost of the plans alone.

Drop a line to

SWIFT
Lock Box 269, OTTAWA, ILL.

PYROMETERS

A Brown Pyrometer on your kilns will pay for itself in two months in the saving in fuel alone, not to mention better ware produced.

Send for 56 page Catalog No. 17

BROWN INSTRUMENT CO.
PHILADELPHIA, PA.
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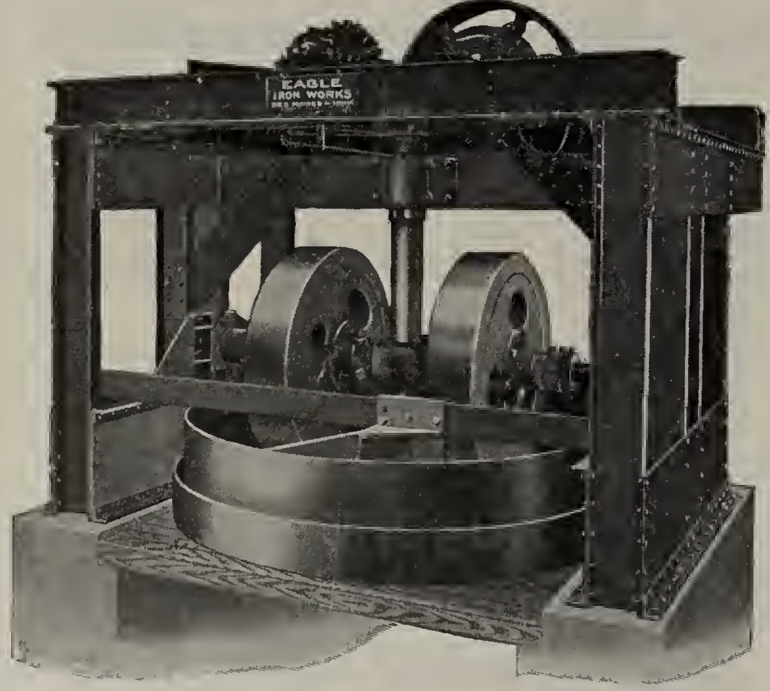
A New Candidate for Favor!
Right in Every Way!



The 8 Foot Steel Frame Dry Pan

Built by the

EAGLE IRON WORKS
Des Moines, = Iowa

THE BURNING OF FACE BRICK IN DOWN DRAFT KILNS.

(Continued from page 95.)

by reason of their high temperature and consequent expansion exert a pressure greater than that of the outside atmosphere against the crown and resist any influence which tends to force them down through the kiln. In a kiln operated by natural draft the gases in the lower portion are under less pressure than the outside atmosphere because of the influence of the low-pressure condition at the base of the stack, and they resist any influence which tends to prevent them from flowing toward the stack. This robs them of part of their ability to transmit their heat to the ware through which they pass. The loss of temperature due to the further expansion which takes place under low pressure would account for some but not all of this. The rapid movement toward the outlets in the floor with the tendency to draw away from the ware instead of to enfold and penetrate it is probably accountable for most of the lack of temperature in this part of the kiln. Therefore, the more the draft can be restricted, the more nearly will the bottom temperature approach that of the top. With forced draft a condition of pressure can be maintained throughout the kiln, forcing the fire gases to penetrate every interstice in the ware. This means that less time will be needed to finish the bottom, hence less fuel consumed. Forced draft also makes possible better combustion in the furnace. It is therefore a step in the direction of economy and better kiln control.

Anthracite Coal.

With forced draft the low-cost small sizes of anthracite coal may be successfully used. They are especially valuable when complete oxidizing conditions are desired. With the barley or No. 3 buckwheat size, a temperature of from 1800° to 2000° F. may be obtained, and if higher temperatures are desired they may be had by the use of the No. 2 or No. 1 sizes. The only disadvantage in the use of this fuel is that the fine ash dust blows into the kiln and settles upon all the exposed upper surfaces of the ware.

Considerably more care is necessary in firing it than in firing bituminous coal, and the labor costs are slightly increased because of the frequency with which the fires must be attended. The only special equipment needed for this fuel besides air pressure is a set of pinhole grates.

(To be continued.)

NOTES FROM DIXIE LAND.

THE BRICK FIRMS at Nashville, Memphis and Chattanooga anticipate a good activity in the next eight weeks, and many preliminary plans are now being made. The terra cotta, fireproofing and clay interests through this section are all active. A good deal of mid-winter building is in progress, though last year fell off some in actual volume of work.

Architect Geo. D. Waller, of Nashville, is preparing plans for a two-story apartment house for ohn T. Lellyett, the same will be of brick and will cost about $15,000. The location is on Thirty-first avenue, near West End.

New York owners will build at Memphis, on the long-time site of the downtown Illinois Central passenger office, Main and Madison streets, a modern building, after plans by Architect G. M. Shaw, of Memphis. Bids will be opened January 12. Wm. Kay is the owner of the property. The structure is of brick and much brick and terra cotta will be used in the remodeling.

The Fulcher Brick Co., of Nashville, Tenn., report several good orders from local territory. "Safety First—Build With Brick" is the slogan they have adopted, and they look to see 1916 an active year.

Referring to the early history of the pottery business in

Tennessee, the following is given by Historian Spence, writing of Hickman county: "On Sulphur Fork, in 1823, Adam Coble erected a pottery, from which he turned out in large numbers, jars, crocks, jugs, lamps, chunrs, etc., of various shapes and sizes. Good potter's clay was found nearby. The wares made by Coble for many years found ready sale in Hickman and adjoining counties."

The Johnson-Porter Clay Co., of Paris, Tenn., is busy at several pits in Henry and Carroll counties, Tenn., shipping clay. After a brief cessation, the latter part of 1915, they are active again.

Work will commence soon on the new building of the Fourth and First National Bank, at the corner of Union and Fourth avenues, Nashville, Tenn. This will be of brick, with a circular corner entrance.

At a meeting of the board of directors of the Nashville (Tenn.) Builders' Exchange, in the Noel Block, Lee Parrish was re-elected secretary and general counsel for the ensuing year. Mr. Parrish has just completed his initial term.

C. LYDE.

BRICK AND BUILDING NEWS OF NORTHWESTERN OHIO.

PETER H. DEGNAN, one of the oldest active business men in Toledo, for forty years connected with the Toledo Builders' Supply Co., died suddenly Wednesday morning, of heart failure, at his home on Jefferson avenue. He was aged sixty-four years and leaves a wife, son, two daughters, two brothers and two sisters. Forty years ago, Mr. Degnan organized the Toledo Builders' Supply Co., with yards on Swan Creek. This firm has become one of the most important handlers of brick and other supplies in the city. Some time after its organization, Thomas J. Degnan, a brother of the founder, was taken into the firm and is still with the concern. At the early age of fourteen years, Mr. Degnan came to Toledo direct from County Roscommon, Ireland, where he was born. He was active in church and charitable affairs as well. He will be greatly missed among members of the trade, all of whom held him in high respect.

Officers of the Enamel Vitrified Brick Co., were re-elected at the annual meeting Tuesday afternoon, as follows: President, J. B. Urschel; vice president, William Urschel; secretary and treasurer, Earl S. Smith.

The January meeting of the Toledo Builders' Exchange was held Monday evening and the following officers elected: President, L. E. Fishack; first vice president, A. Kelsey; second vice president, S. J. Pickett; directors, H. E. Brown, T. W. Ludwick, George Neukom, F. R. Stahl, H. Thorspeck and J. P. Weyant.

There is a great to-do over the Oak street paving contract in Toledo, all because Alexander E. Forster, Oak street property owner, has demanded and secured an injunction preventing the service director from entering into a contract for paving the street with asphalt, as the board of control had intended. Forster contends that the $48,000 contract was awarded to H. P. Streicher, although Streicher's bid was not the lowest, and he contends that the majority of the property owners petitioned for a brick pavement and ought not to be compelled to use asphalt if they want brick. An attempt was later made to dismiss the injunction, but this Judge Ritchie refused, declaring that the work could not be done until spring, anyway. There is talk of another petition being circulated for asphalt, there being a contention among the enemies of brick that Forster is trying to force the brick issue because his teams haul coal down that street. There is also some talk of trying to substitute wood block. Just now the brick men seem to have the whip hand in the situation.

T. O. D.

BUILD WITH BRICK

GANDY

Lower Your Belting Costs With Gandy

YEAR after year the number of concerns who use GANDY STITCHED COTTON DUCK BELTING has grown, until today there are thousands in all parts of the country.

These concerns could only use it if it actually saved them money—otherwise they would not reorder, nor would new concerns after once trying GANDY adopt it.

So we ask you to find out, just as others have done, whether Gandy Stitched Cotton Duck Belting can reduce your belting expense, as it has for them.

Remember, you are not making an experiment. Gandy's 37 years of use is evidence enough of its reliability. In writing us for information about prices, etc., you are not obligating yourself in any way, but merely placing yourself in a better position to consider it more definitely. If GANDY can save you money, as it has done for so many others, you want to know it.

Write us today.

The Gandy Belting Co.
749 W. Pratt Street
Baltimore, Md.
New York Branch, 36 Warren St.

INDUSTRIAL LOCOMOTIVES

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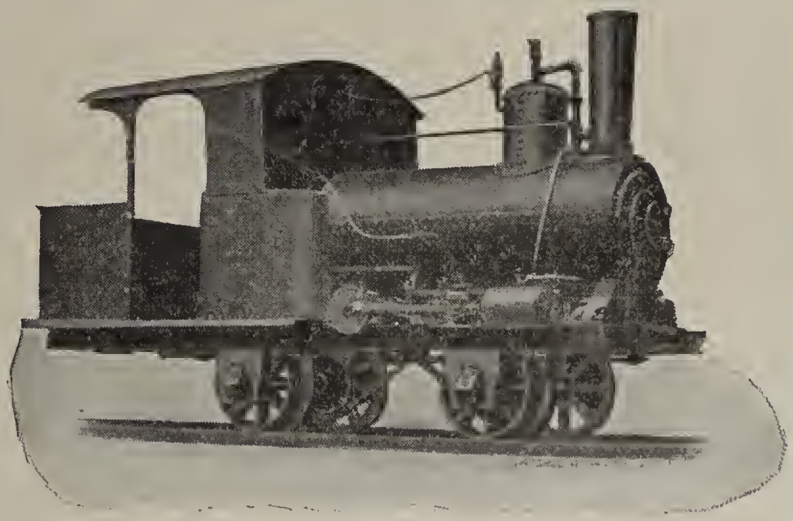
5 TON AND 12 TON.



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Others in the immediate neighborhood are at the plants of Armstrong Cork Co., Mayer China Co., Fallston Fire Clay Co., Darlington Clay Products Co. and Sebring China Pottery Co. Our reputation thereabouts is good.

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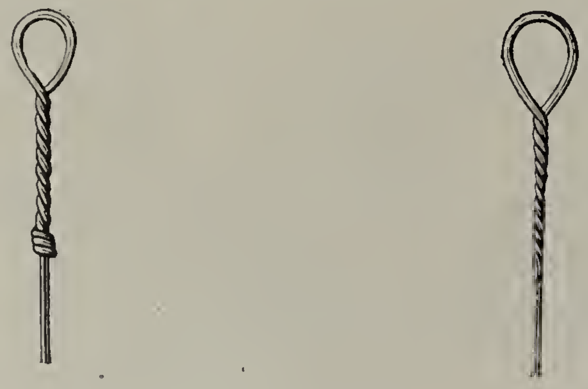

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Robbins, Tenn.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

JUST AS PREDICTED earlier in the year by Building Inspector W. D. Harper, the building record in Milwaukee for 1915 showed a decided gain over that of the previous year. Figures prepared by the building inspector's office show that 3,881 permits were issued for structures to cost $12,311,397, as compared with 3,865 permits and an investment of $10,253,036 during 1914. Inspector Harper says that the activity in the building field during the last half of the year was indicative of the improvement which took place in general business. During the month of December there were 166 permits issued for structures representing a cost of $760,467, as against 132 permits and an expenditure of $530,007 during the corresponding period in 1914.

Building Inspector Harper predicts that the building investment in Milwaukee during 1916 will total at least $17,000,000, basing his assertions on the various large building projects already launched and upon the improvement which has taken place in general lines of industry. One of the largest of these projects is the one involving the erection of the Plankington Arcade building, a hotel and a theater on the site of the historic Plankington Hotel and representing an ultimate investment of at least $2,000,000.

Ricketson & Schwarz, well-known brick and general building supply firm of Milwaukee, has been awarded the contract for furnishing 450,000 brick for the eight-story Plankington Hotel, which is being erected at the northwest corner of West Water and Sycamore streets, comprising one of the structures which will occupy the block. The building will be of brick and steel, of fireproof construction, eight stories and basement, and will be 120x200 feet in dimensions. Its cost will be at least $500,000.

Announcement has been made that a $300,000 structure for office purposes will be built on the southeast corner of Third and Wells streets by Hugo Loewenbach, owner. The property has been leased for a term of ninety-nine years by J. B. Olinger and Fred A. Landeck. It is understood that the plans will call for a twelve-story structure, the main floor to be used as a moving picture theater.

F. G. Moritz, Milwaukee dealer in building supplies and face brick, formerly located at 614 Caswell building, is now settled in new and larger offices at Suite 312 in the same building. Mr. Moritz is making a specialty in face brick.

The General Construction Company, of Milwaukee, has filed a complaint with the Interstate Commerce Commission, alleging that the Chicago, Milwaukee & St. Paul railroad and connecting lines have been charging 23 cents per 100 pounds on shipments of stone from Milwaukee to Munising, Mich. The company contends that a fair rate would be 12½ cents.

At an enthusiastic meeting of the stockholders of the Whitewater Brick & Tile Company, of Whitewater, Wis., plans were made for raising $50,000 to complete the erection of the large and modern plant, now under way. Nearly $20,000 of the $50,000 was pledged at the meeting and assurances were given that the remainder would be available.

The Cook & Brown Lime Company, of Oshkosh, Wis., has purchased the Radford Brothers & Company saw mill site in that city and has announced that it will open a modern brick plant and yards on the property. Clay for the manufacture of brick will be brought down by boat from the company's clay beds near Stockbridge across Lake Winnebago. It is expected that about fifty people will be given employment in the new venture. Plans for the new brick industry were completed a year ago, but business conditions were such that the Cook & Brown concern felt it advisable to wait until the business outlook improved.

Brick and building material men are much interested in the fourth annual convention of the Master Builders' Association of Wisconsin, scheduled to be held at Madison, Wis., January 14 and 15. Headquarters will be in the assembly chamber of Wisconsin's new $9,000,000 state capitol building. The leading speaker will be H. L. Lewman, of Louisville, Ky., president of the National Association of Builders' Exchanges of the United States, whose topic will be: "What is Best for the Building Industry?" Mr. Lewman was the principal promoter of the new uniform contract documents recently approved and adopted by the American Institute of Architects, and has a wide experience in matters pertaining to the building trade.

The new brick manufacturing concern organized at Marshfield, Wis., some time ago and later incorporated with a capital stock of $25,000, recently burned its first kiln of brick, 100,000 in number, which will be used for the erection of the various buildings of the new plant. An engine room, 40x60 feet in dimensions, and a drying shed, 40x110 feet, will be built. The first kiln was erected some time ago. The dry room will be warmed by radiated heat and will be capable of holding 20,000 brick, which, during the drying process, will be piled on steel cars each holding 500 brick. The clay will be taken from the pit and carried into the plant by use of cable. It is hoped to have the plant completed and brick ready for operation by next May. The first brick turned out were of especially fine quality and fully up to the expectations of the founders of the company. Officers of the new concern are: Louis Hartl, president and treasurer; Jacob Krasin, vice president and secretary, and Ernst Krause, superintendent. A. BADGER.

TEST OF HOLLOW BUILDING TILE.

A very interesting test of hollow building tile has been made by the United States Bureau of Standards. A floor slab 6 feet wide and 30 feet long, continued over three piers 15 feet apart, was made of this class of material. This tile is of a special type for use in floor slabs, and is made so that the bottom surface is about 2 inches wider than the top. In laying the tile in the form of a slab, the pieces touch on the bottom, but are about 2 inches apart at the top. This space continues throughout the length of the slab, and is filled with a mortar of the composition of one part of cement and two of sand, in which are placed several reinforcing rods, bent up at the ends of the slab and continued through the concrete beam into the next adjacent slab.

In the present case the two slabs were allowed to age for one month. Tests were made of these, loaded uniformly with pig lead, numerous deflection readings being made as different loads were applied. One of the slabs failed at about 603 pounds per square foot. The other was able to withstand a slightly greater load, 690 pounds per square foot. Failure occurred in the mortar beams, due largely to the inferior grade of reinforcing used. One of the concrete supporting piers also failed near its base. While the load carried was not up to the expectations of the manufacturers of the tile, yet it was considerably in excess of that demanded by most building laws.

THE CEMENT PRODUCTION.

The Portland cement industry has been practically at a standstill for two years now, so far as quantity of production and consumption is concerned. Exploitation has continued fairly active, but from some cause or other it has not added materially to the annual consumption. A preliminary report on the cement industry for 1915 indicates that the shipments from the mills during the year were 86,524,500 barrels, which is an increase of only one-tenth of 1 per cent. over 1914. There was a slight decrease in production, and this, coupled with the slight increase in consumption, has resulted in some reduction of the stock on hand, which has been more or less of a burden on the industry for several years now. As a rule, the prices averaged somewhat lower per barrel in 1915 than in 1914, yet at the end of the year the general revival in business seems to have brought some increase in cement prices, and this makes the outlook for 1916 much brighter than for several years. Perhaps if the predicted building boom comes on the present year, cement, like other building material, will enjoy enough increase in demand to stimulate production and enable the manufacturer to make more progress in volume as well as more profits in business.

Use Carbide Coating

Save Money! Make Money!

It is claimed that 40% of the heat generated in the average kiln is **lost,** radiated from the crown and walls. Two coats Carbide Coating applied inside the crown of a kiln will reduce radiation 75% at that place.

Carbide Coating will endure heat that will fuse fire brick. It is acid, gas and all chemical fumes proof. It will protect joints, seal expansion and other cracks, and increase the life of kiln and furnace linings. Prevent rust on dryer cars, hot air, waste heat and steam pipes, and protect metal from sulphur, acid and other corrosive fumes and gases.

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It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

MODERN CLAY-WORKING ENGINEERS

And Builders of Complete

BRICK MAKING PLANTS

For Either Soft or Stiff-Mud Processes.

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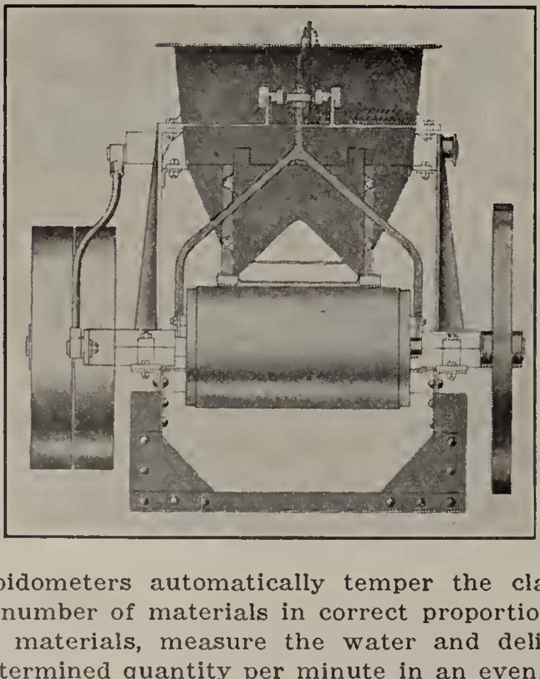
The Schaffer Poidometer
PATENTED



The Poidometers automatically temper the clay. They unite any number of materials in correct proportions. They weigh the materials, measure the water and deliver them in a predetermined quantity per minute in an even, constant flow.

They cause a uniform column of clay to flow from the brick machine at a regular speed.

INVESTIGATE AND
INVEST IN THESE MACHINES.
IT WILL PAY YOU.

The Schaffer Engineering & Equipment Co.
Tiffin, Ohio

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

THE PAST MONTH HAS brought the usual winter weather, causing general interruption of building operations, with the closing down of many of the common brick plants, although most of them could operate through the winter if the market warranted. The past year, as a whole, has been very quiet in building, though the manufacturers of common brick feel that they came out as well as they could expect, being aided by some very large contracts for public buildings and manufacturing plants; and with prices fairly well maintained the year was not the least profitable in their experience. The plants now closed are being overhauled and put in good shape to resume operations, though stocks of brick are heavy and conditions do not appear to warrant any increase of capacity or additions, other than those needed to keep abreast of the times.

As for the outlook, the seasonable decrease in actual work is accompanied by a remarkable increase in figuring, and a few important construction contracts have been let, though thus far no large quantities of brick or terra cotta have been involved. A strong and general industrial revival within the last three months is already bringing more demand for factory buildings; and in this city there is more figuring on both office buildings and apartments than at any time in the past year. It is believed, moreover, that the extreme price asked for reinforcing steel, corrugated iron, etc., and the rapid advance in lumber, should favor brick for some classes of building.

Fire brick is in good demand for this season, and the outlook is good. With many factories overhauling their boilers, etc., a good deal is being used at present; while the recent establishment of several very large oil refineries in the San Francisco Bay region, and the present extreme activity of steel manufacturing plants in this vicinity, will involve a steady increase in requirements for some time to come. Chemical plants, also, have been unusually busy for the last few months, and are using considerable quantities of fire brick and other clay products.

At the regular meeting of the San Francisco Masons' and Builders' Association at the Builders' Exchange, January 3, the following officers were elected to serve during the ensuing term: President, Emil Hogberg; first vice president, E. S. Rainey; second vice president, Alonzo Reed; secretary, William S. Scott; treasurer, J. E. Brennan; directors, Thomas J. Campbell, W. A. Rainey, A. W. Lawson, J. J. Butler and N. Larsen; arbitration committee, Jerome Collins, Thomas F. Mulcahy and William S. Scott.

The new Builders' Exchange at Sacramento, Cal., met recently and named the following as a membership committee: W. Keating, C. Guth, R. Rowe, I. C. Boss, E. Hite, W. Scoville, C. V. Schneider, T. Enright, P. J. O'Brien, E. S. Warner and B. Scollan. A meeting will be held January 11 to name an executive committee.

J. R. Gwynn, manager of N. Clark & Sons, made a short trip to Los Angeles just before Christmas. He says things are rather quiet there now, though there is considerable figuring there as well as here. Locally, he says the plant is running steadily on a number of small contracts, and he looks for more activity in the terra cotta business.

As a step in settlement of the affairs of the California Safe Deposit & Trust Company, which failed in 1907, the property of the Carnegie Brick & Pottery Company, which was considered as one of the most valuable assets, was put up for auction January 14, at the Stockton (Cal.) court house, by U. W. Brown, trustee. The property, most of which is in the southeast part of Alameda county, includes one of the largest brick and pottery plants in the state, which has, however, laid idle for several years and would require considerable investment to place it on an operating basis. It is believed that someone representing the majority of the bondholders will take over the property, and that, if market conditions seem favorable, it will be started up again within the next year or so.

Within the next month the Richmond plant of the Los Angeles Pressed Brick Company will have the use of the new spur track from the Santa Fe railroad, which has been under construction for some time.

The K. & M. Pottery Company, of Los Angeles, has purchased a half acre site near the corner of Fifty-second and Santa Fe avenues in that city, and has under construction buildings and kilns for the manufacture of flower pots, jugs, jars, etc.

Chris Berg, of the Port Costa Brick Works, says the plant has been closed for the last few weeks and reports business quiet at the moment, though he looks for a fairly good year as soon as the weather settles.

The Steiger Terra Cotta & Pottery Company kept its plant in South San Francisco running full blast right up to the holidays. Since then there has been no rush, but the company is estimating on a great deal of prospective work, some of which is expected to close shortly.

The California Tile Contracting Company has opened a display room and office at 5 First street, San Francisco.

Paul E. Ussher recently put up at auction a lot of 70,000 brick at the plant formerly owned by the Adamant Manufacturing Company at Sacramento, Cal., to satisfy his claim for caring for and keeping the brick.

The Independent Pressed Brick Company was recently incorporated at Sacramento, Cal.

Eugene Corrigan, of the Stockton Fire & Enamel Brick Company, expresses great confidence in the future of the business in this district. Activity due to the war, he says, has just begun to be felt here, following a period of paralysis; and he believes there are prosperous times ahead for the whole Pacific coast, not only during the war, but for many years thereafter. In fire brick, he says there is nothing special under way at the moment, but looks for an early revival of business.

The Denny-Renton Clay & Coal Company, of Seattle, is making large deliveries for the Puget Sound News building and the Times building in that city, both good-sized terra cotta jobs. The company's interests at San Francisco are still represented by Mr. Laumeister, but he says no new business is being sought here at present.

The U. S. Fire Clay Company, at Murray, Utah, is increasing its capital stock from $100,000 to $500,000, in preparation for a general increase of capacity. Work will be started shortly on a sewer pipe department, and a full line of terra cotta equipment will be put in, the plan being to start up the new departments during the summer. SUNSET.

San Francisco, January 4.

ANNUAL ROAD BUILDERS CONVENTION.

The thirteenth annual convention of the American Road Builders' Association has been changed a week from the original date, and is now scheduled for the week of February 28, the closing day being March 3. The meeting will be held in Pittsburg and an interesting program is being worked out. The American Road Builders' Association has, after several years of consideration, wisely decided to hold only one convention a year, and it extends to the American Highway Association an invitation to meet at the same time and the same place, the idea being to reduce the number of occasions of this kind, which, it is thought, will make for better attendance and more satisfactory work, with less confusion and expense to those interested in promoting good roads. The meeting will include an extensive showing of machinery and material for road building and will be in Mechanical Hall.

SAVE
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TIME,
LABOR.

IMPROVE THE QUALITY OF YOUR WARE.

INCREASE THE CAPACITY OF YOUR KILNS

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Air and sunshine won't do it, nor will any artificial dryer do it except the BOSS TEN-HOUR UNIT-CONTROL DRYER.

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FOR SALE.

Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

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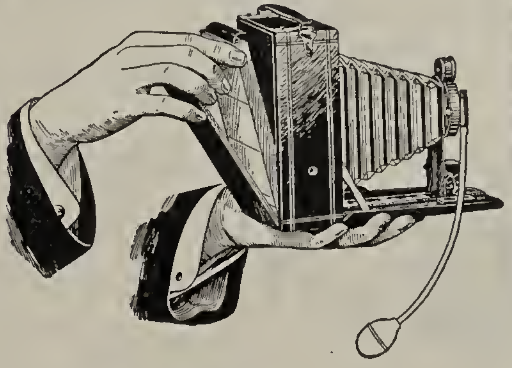
Open back—drop in pack—close back—that's all you do to load a



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To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares.
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The Yates Patent Down-Draft Kiln Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

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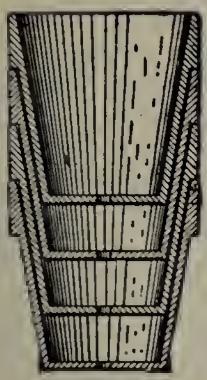

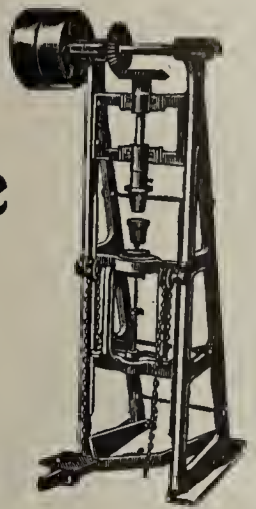

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Capacity in 10 hours:
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A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

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Builders of
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Dry and Wet
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for Brick, Terra Cotta,
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Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

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Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

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Correspondence solicited.

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Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

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YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

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Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

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$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) **$2.00**

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CARBONATE OF BARYTES

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Oxide Tin,
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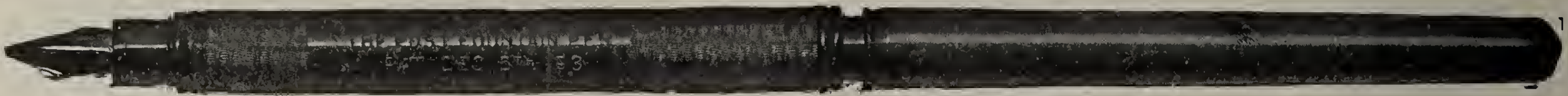
all Chemicals used by the Clay Trades.



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We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for $3.00

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A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

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Early reservations are wise, because they make it certain that you can have what you want. Hotel Statler will gladly send rates and detailed information, if you are not familiar with the house.

Every room has private bath, thermostat, bv which the guest may regulate temperature of room; running ice-water, and other unusual features that make for comfort. Morning paper delivered free to guest rooms.
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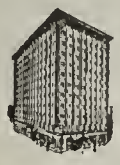

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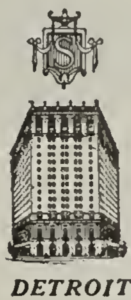

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800 Baths

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used in connection with our SPECIAL CLAY PLOW is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
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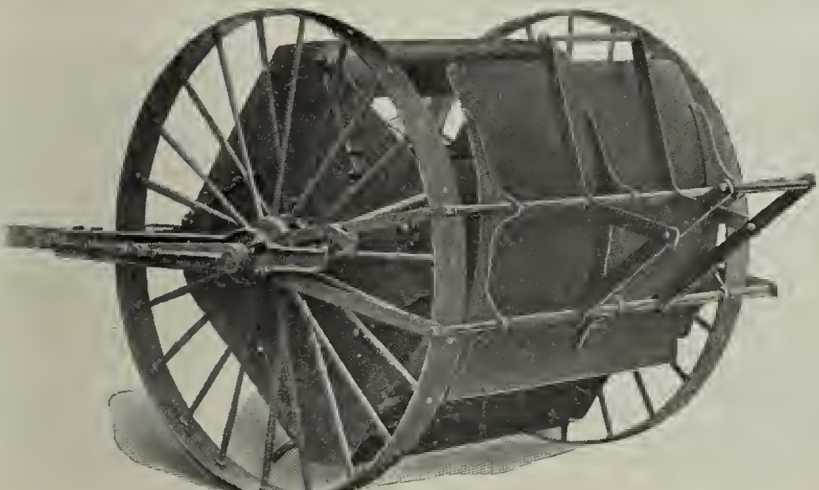

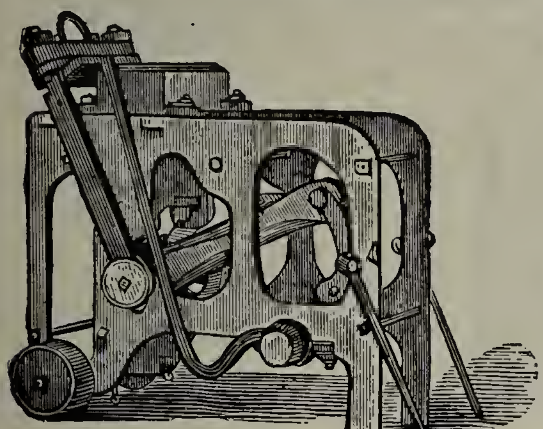

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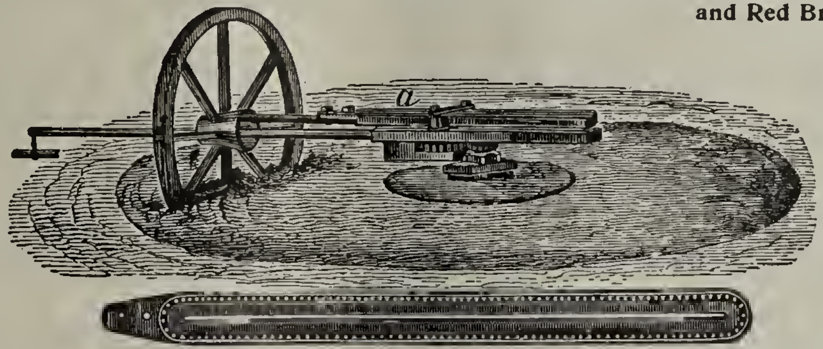
Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



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that in the BURNING OF BRICK a DRAFT GAGE is of greater advantage than a PYROMETER? We furnish both.

DO YOU KNOW

that for many years we have made the BEST DRAFT GAGES for all styles of kilns?

Write us for information of all kinds of controlling apparatus for clayworkers.

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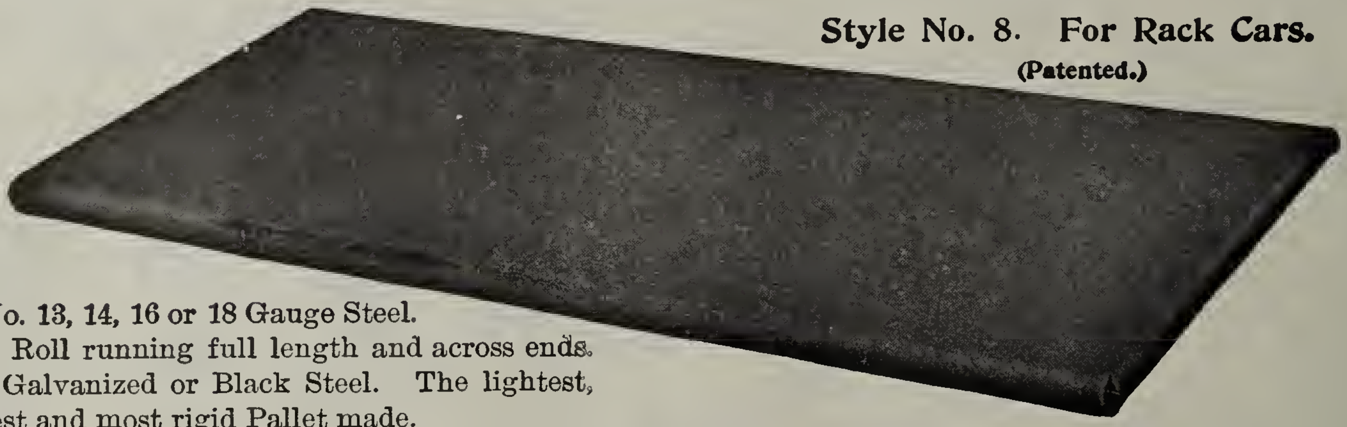
"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)



Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends. Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

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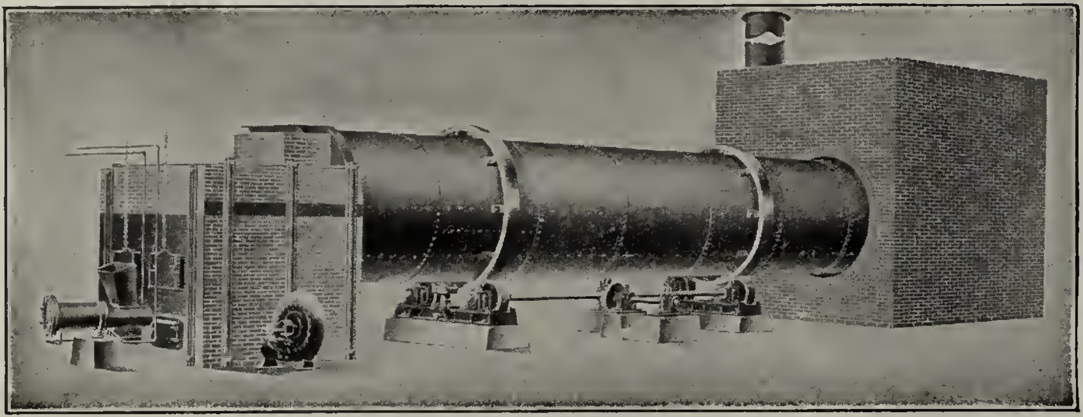

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DRY YOUR CLAY
AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

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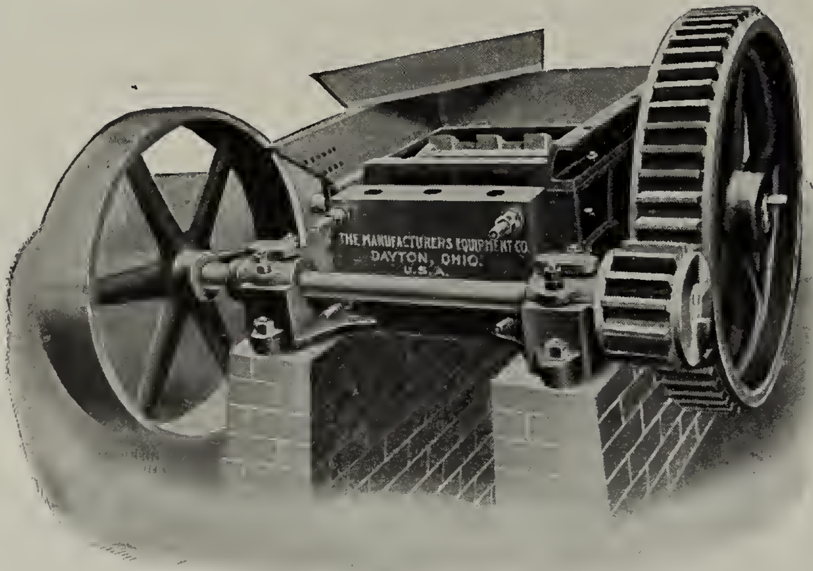

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The Crusher Ideal for Every Desirable Performance

Crushes Hard Rock, Shale, Fire Clays, Vitrified Products, etc.

Unlike crushers of other types it crushes the material and is **FREE OF THE CLOGGING EVIL.**

Its capacity is wonderful for both the size of pieces it will handle and the amount of material it will crush.

It will prolong the life of dry and wet pans and materially reduce their cost of maintenance.

Upkeep is practically nothing and its power and labor requirements are negligible.

We have a size that will meet your condition and at a price that will be a temptation to buy.

A most interesting booklet telling all about the crusher is now being published. The issue contains a copy for you. May we send it to you? A postal reply is all that's necessary.

The Manufacturers Equipment Co.
Complete Clayworking Equipment
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These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

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A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

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A book whose 330 pages are filled with rules and hints for the foreman and bricklayers, designed to increase the output of the workmen and enable them to do difficult work in the best manner.

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A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

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Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

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A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

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Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

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A book of authority, giving the cause and remedy of scum and efflorescence.

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A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

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Indianapolis, Ind., U. S. A.

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Room 1717
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After you have succeeded in making a good brick and are ready to put it on the market, advertise it to everybody in your part of the world. Your salesman can not reach a ten thousandth part of the people a good advertisement can. Even if you can sell to but a few in every ten thousand who read your appeal, most of them will come to know and talk about you.

Then you may help to sell brick for some of your competitors, which in the end will be a gain to you, for it boosts the brick game and increases the demand for your product. Besides, it puts up another brick house somewhere which stands as a perpetual demonstration to a great many people of the value and beauty of brick and that is always the best advertisement of all.

And when you advertise brick, you may be proud of of the fact that you offer the universally best building material in the world, a material that combines the most honorable inheritances of a distinguished antiquity, with the highest values of quality and service. Square, sound to the core, enduring, your brick offers to the world economy, safety, comfort, and beauty in mansion, fane, or humble cottage.

Sound the praises of your brick to the world, until the world comes to recognize you yourself as a brick.

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Ceramic Engineers *Factory Architects*

GEOLOGICAL EXAMINATION OF PROPERTIES
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PLANTS DESIGNED, CONSTRUCTION SUPERINTENDED AND OPERATIONS DIRECTED
DRYERS, FURNACES, KILNS
REMODELING OLD PLANTS GIVEN SPECIAL ATTENTION
DEVELOPMENT OF NEW LINES OF PRODUCTS
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Pamphlet "Ceramic Engineering" Free

AND THEY SAID IT COULDN'T BE DONE!

More than one hundred firms and individuals in a dozen different states have united in a campaign to educate the American builder in the way of SAFE building.

The men back of this national movement represent every accepted fire-safe material and include engineers, architects, contractors, fire engineers and city officials.

This is not a campaign to sell any one material, nor is it an effort to "knock" any type of construction.

The medium of this great movement is an organization devoting its whole enery to convincing prospective builders that it not only is safer and better to build with materials that will resist fire, but that it actually is cheaper in the long run.

This organization is known as THE SAFE and it is making converts every day, and in the territories where it is active the building records show a marked increase of the use of fire-safe materials.

Why aren't you a part of this movement?

Let us send you free copy of address delivered by John J. Thomas, The Lloyd-Thomas Co., Chicago, which PROVES that safe buildings are cheapest.

SAFE
PROTECT YOUR HOME

THE SAFE

Society Advocating Fire Elimination

R P. Stoddard, Secretary

356 Leader-News Building CLEVELAND, OHIO

THIS DRYER WILL SAVE YOU MONEY

THE "Wellington" Improved Steam Pipe Rack Dryer combines every possible Economy with the highest degree of Efficiency.

IT is a low pressure vacuum system with the FIRST COST LOWER than any other dryer. It can be installed at LESS EXPENSE and operated at a big saving in power and labor.

WE will give you the facts and figures to PROVE IT or you can ask any of the many satisfied users of this economical dryer.

> WHAT ONE OF OUR MANY SATISFIED CUSTOMERS HAS TO SAY.
>
> Wellington Machine Co.,
> Wellington, Ohio.
>
> Have found your Dryer a **grand success.** We are having **no trouble** and are actually drying brick in this Dryer that **does not cost us a cent.** The Wellington Dryer is one of the **best on the market.** THE OHIO BRICK CO.,
> A. R. Kuhlman, Mgr., Toledo, Ohio.
> June 29, 1915.

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Barkwill Brick Co., Cleveland	120,000 capacity
American Bldg. Brick Co., Cleveland	30,000 capacity
Collingwood Brick Co., Toledo	35,000 capacity
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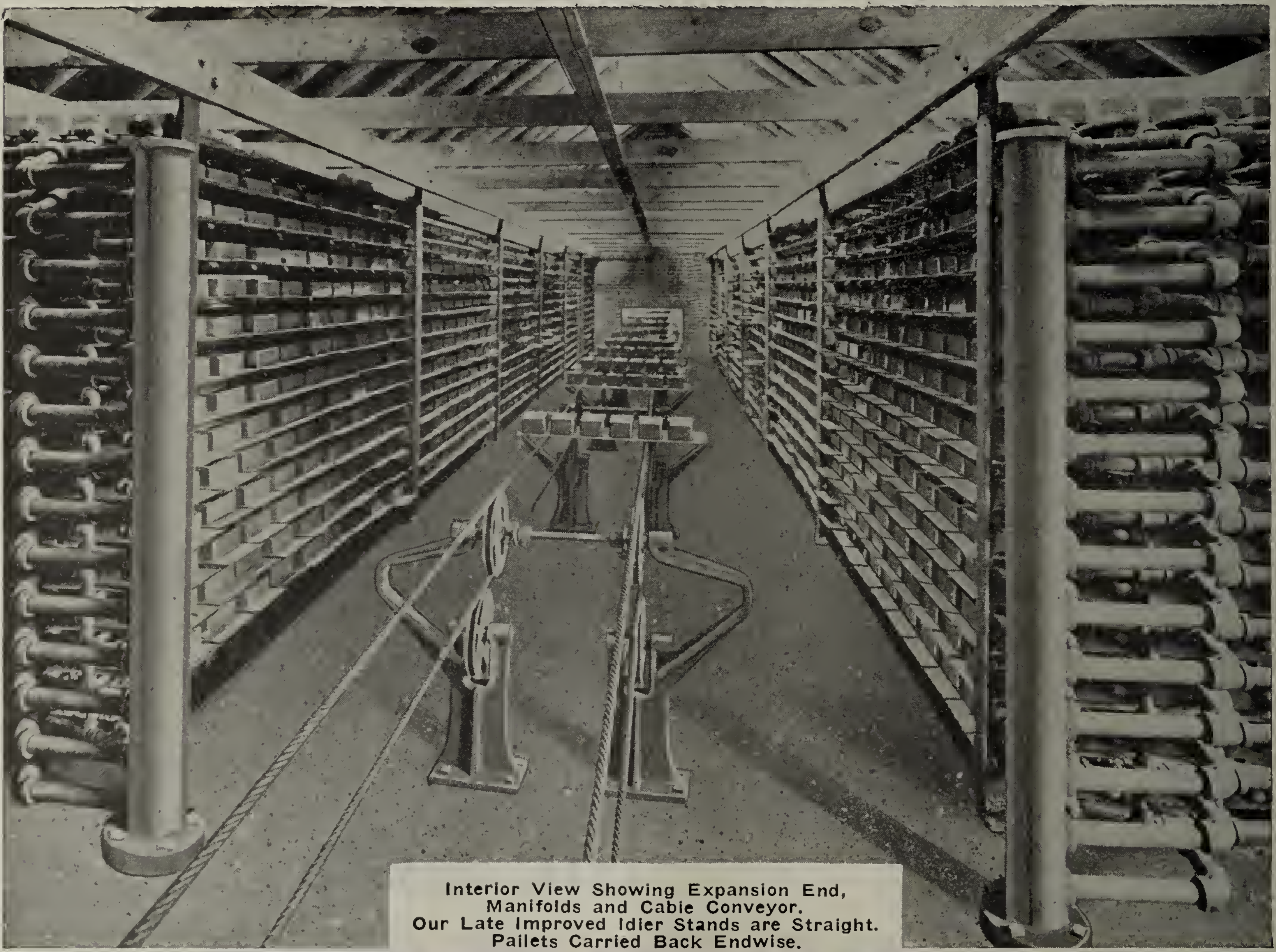
Walker & Frank Brick Co., Detroit	35,000 capacity
Farr Brick Co., Cleelandv, H plant	120,000 capacity
Standard Brick Co., Cleveland	120,000 capacity
Owen Hatten Brick Mfr., Philadelphia	25,000 capacity
Thornton Bros., Rudyard, Mich.	15,000 capacity
Ithaca Brick & Tile Co., Ithaca, N. Y.	30,000 capacity
Mercier-Bryan-Larkins Brick Co., Detroit	60,000 capacity
The Cook & Brown Lime Co., Oshkosh, Wis.	40,,000 capacity



Interior View Showing Expansion End, Manifolds and Cable Conveyor.
Our Late Improved Idler Stands are Straight.
Pallets Carried Back Endwise.

The Wellington Machine Company

Wellington, Ohio

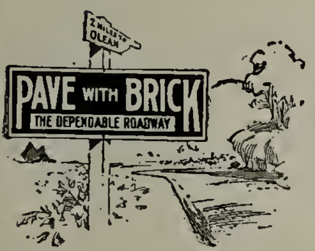
JOIN THE

BOOST BUILD WITH BRICK **BOOST**

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.



IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $5.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $6.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

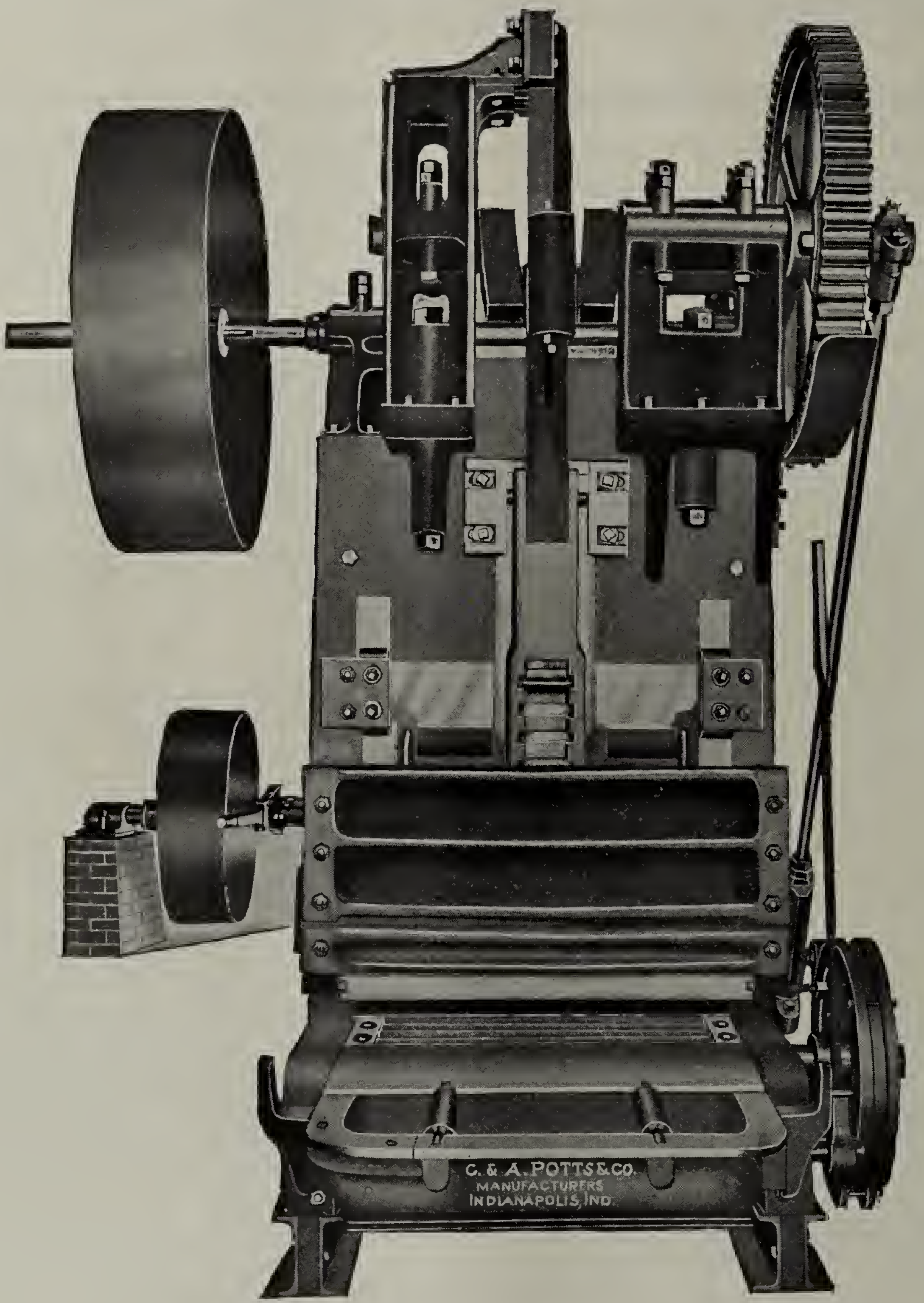
....

(Cross out the items not wanted, fill in and mail us the coupon.)

The Potts Special Soft Mud and Fire Brick Horizontal Brick Machine

Drop Forged Crank Shafts. Cut Steel Gears. Large Bearings. Heavy Powerful Press. No Light Parts Working in the Clay.

Note Heavy Construction of Press on Special Soft Mud and Fire-Brick Machine. Built for Service.



FRONT VIEW

The Most Complete Brick Machine Ever Built

WRITE
FOR
CATALOGUE.

C. & A. POTTS & CO.
INDIANAPOLIS, IND.

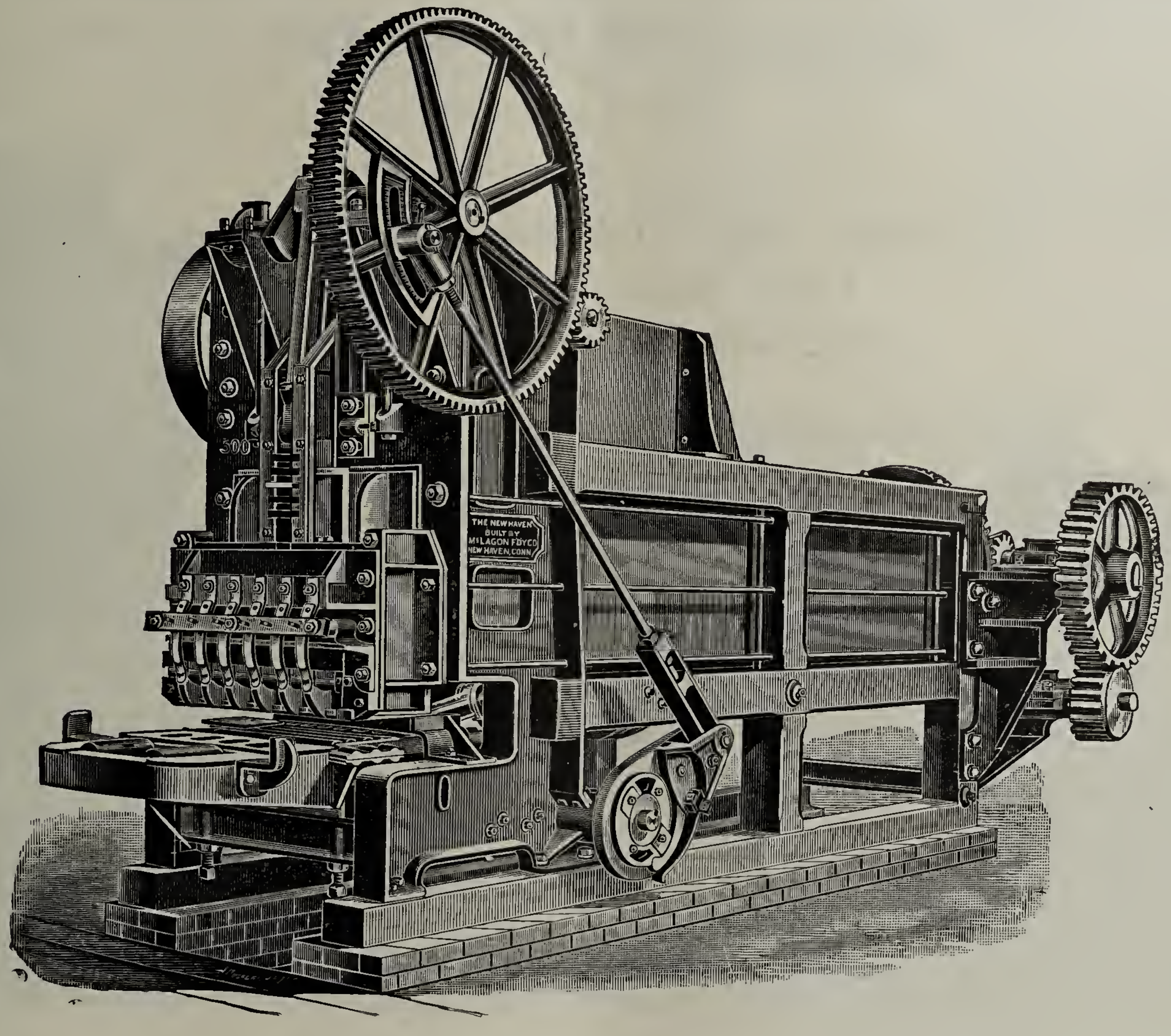
LET US
KNOW
YOUR WANTS.

Soft Clay Brick Machines

Are the only kind we build, and it's our aim to build them well. They are the reliable kind, with great strength placed just where it is most required.

Stout shafts, long bearings, large oil holes, strong gears, steel liners and other details in proportion. They are the kind

❦ ❦ *THAT DON'T BREAK DOWN EVERY DAY* ❦ ❦



"NEW HAVEN" HORIZONTAL BRICK MACHINE.

"New Haven" Brick Machines

Came into existence some twenty-seven years ago, and they came to stay. They have staid so well and are so well liked at home that three-fourths of all the brick made in New England are the product of **"NEW HAVEN" MACHINES.** They excel everything and

FOR HARD SERVICE ARE SURE TO SATISFY

Where others fail. That is the reason all our machines are standing advertisements and why all our patrons recommend them. Such machines are worth investigating.

The EASTERN MACHINERY CO.

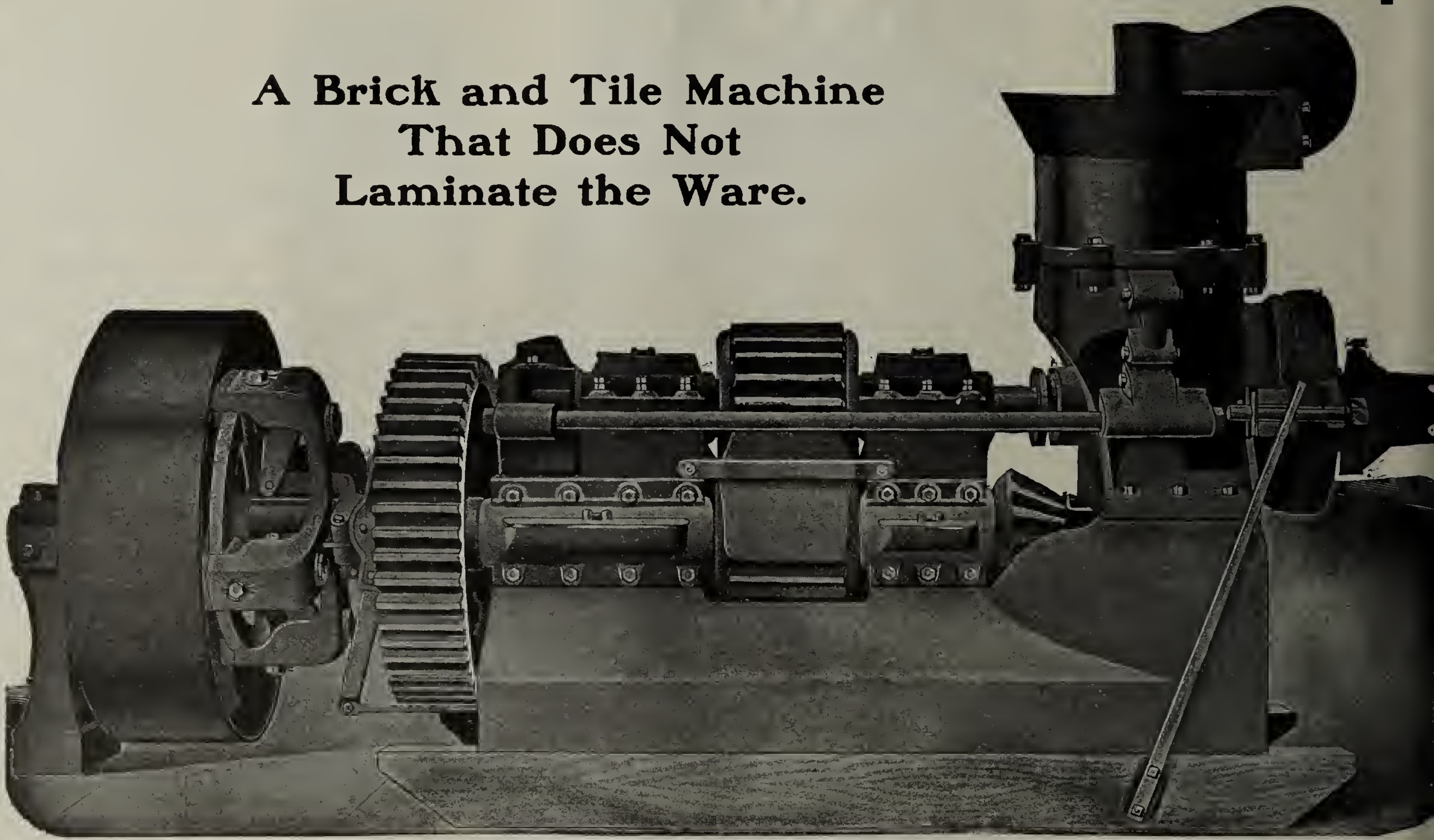
NEW HAVEN, CONN.

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

**A Brick and Tile Machine
That Does Not
Laminate the Ware.**



The Big Wonder Brick and Tile Machine

We also make Side=Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

THE WALLACE MFG. CO.

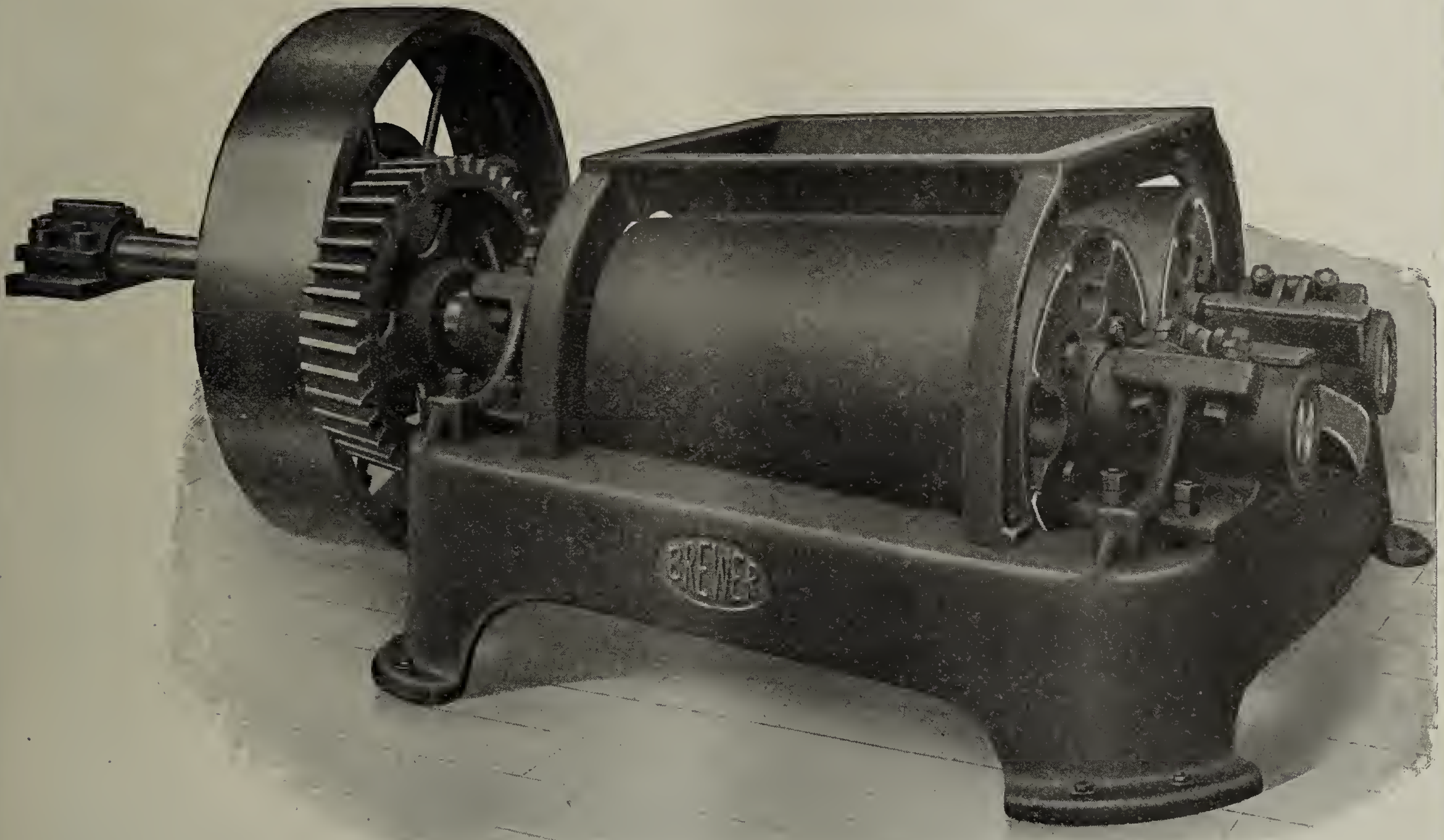
FRANKFORT, IND.

IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD

CLAY CRUSHERS

We make a specialty of Crushers. We build all kinds and sizes—Conical, Straight, and Beaded Roll Crushers, Compound Crushers, Disintegrators and Dry Pans.

We make the rolls with removable shells and we make the shells of a special hard and durable material, which compared on a basis of cost, outwears manganese steel or anything else.



But Crushers are only a small part of our line—we also build

Brick Machines, Drain Tile Machines, Automatic Cutters, Pug Mills, Granulators, Hoists, Conveyors, Etc.

GET OUR COMPLETE CATALOG.

H. BREWER & CO. BREWER **Tecumseh, Mich.**

WE ARE PREPARED

to furnish you with anything you may require in the line of Clayworking Machinery, Dryers and Continuous Gas Fired Kilns.

We shall always have on hand any spare parts for machinery of our manufacture, and equipments needed or useful in connection with clayworking.

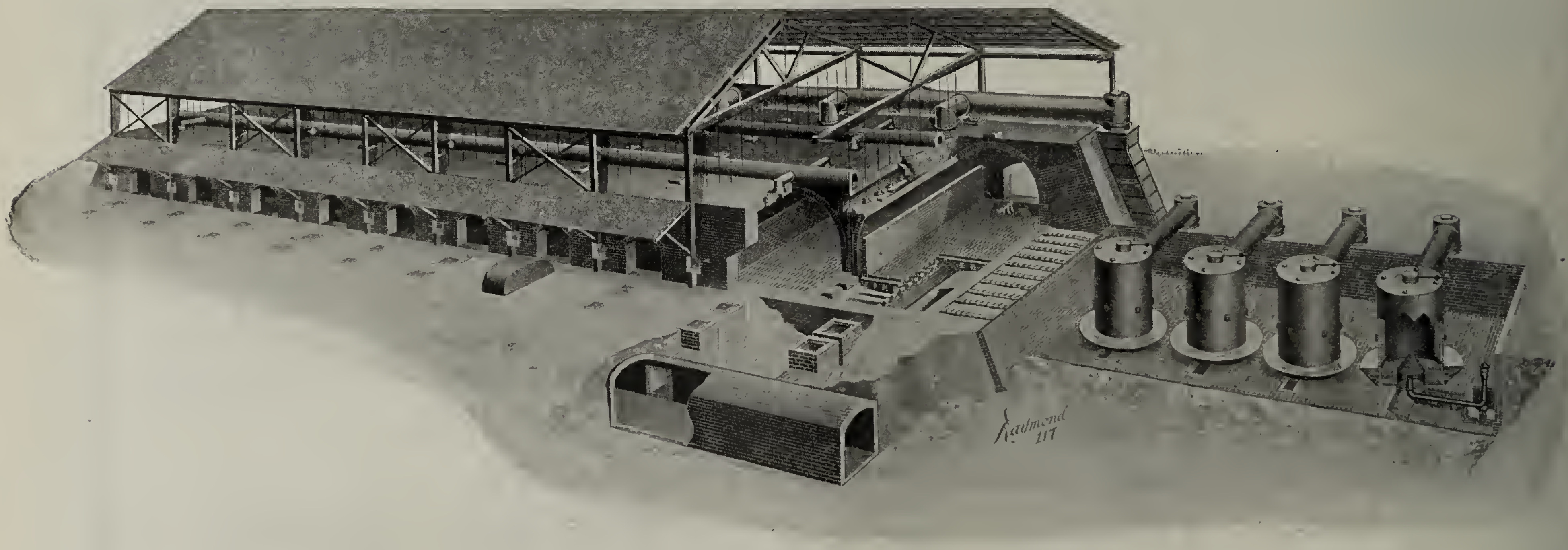
We are especially equipped with facilities for testing clay and telling you of its value for any purpose you may wish, and shall be pleased if you will avail yourselves of them.

We shall continue all the lines formerly handled by the C. W. Raymond Co., and add to them from time to time as improvements or additions are made.

We intend, by care, courtesy, efficiency and attention, to make ourselves valuable to you, and we solicit your inquiries.

INTERNATIONAL CLAY MACHINERY CO.
Dayton, Ohio

Successors to
The C. W. Raymond Co.



The Producer Gas Fired Continuous Kiln.

CABLE ADDRESS
"STEELE"

J. C. STEELE
C. M. STEELE
H. O. STEELE
A. P. STEELE
F. F. STEELE

J. C. STEELE & SONS

MANUFACTURERS OF

BRICKMAKING AND CLAYWORKING MACHINERY

STATESVILLE, N. C.

January 1, 1916.

CLAYWORKERS, GREETING:

We thank our friends for the liberal patronage and kind words they have given us in the past, and wish all a share in the prosperity now visible on every side.

To those who have not tried us, we refer to any with which we have ever had dealings as to our efficient service and liberal treatment.

We think our most effective claim for consideration is our record in holding our customers. Very few, if any, have ever left us, after using STEELE EQUIPMENT. Many of them have come back more than once for larger outfits as their business grew.

The five members of our firm have been working together from twenty to twenty-five years, on stiff mud problems, securing a relation of parts, working so perfectly in harmony as to secure smooth operation, with minimum wear, power and noise—a marked contrast to the labored effort often apparent.

Our dies mark great advances.

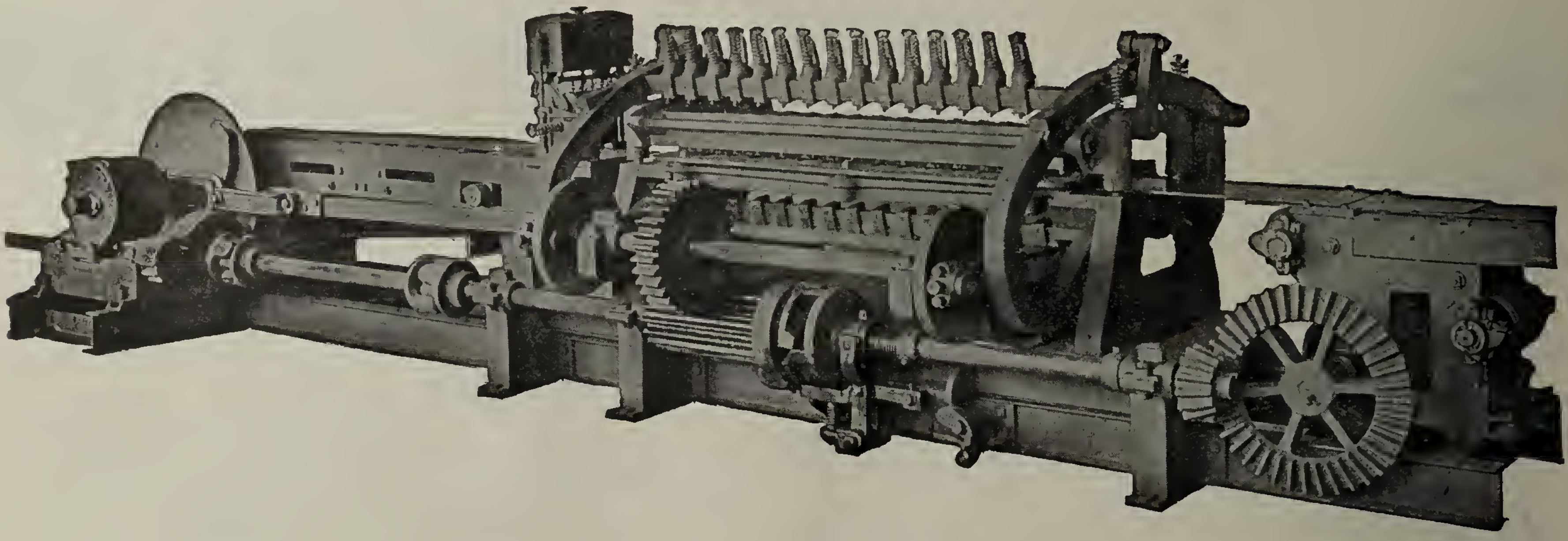
While we build small outfits, which fully meet the requirements of small plants, we also build the largest and heaviest outfits that meet the requirements of the largest producers.

We have recently developed a larger and more improved side cutter, and a heavy smooth roll crusher, rolls 32″ in diameter. We will be glad to give you information.

Very truly,

J. C. STEELE & SONS.

Western Representative:
Mr. Geo. H. Smith,
510 Reliance Building,
Kansas City, Mo.



Model T 60 Reciprocating Automatic Cutter

For building brick, fire brick, and repressed or Dunn Wire=Cut=Lug Pavers.

A thoroughly dependable automatic cutter—

Sure=Acting, because its mechanism is positive;

Economical, because of the very few wearing parts;

Understandable, because of the extreme simplicity of its mechanism.

The cutter that is now cutting most of the paving block made.

FIND D. M. of P. E.
IN ROOM FOUR FORTY=THREE

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

Mention The Clay-Worker.

For
Sixty-Three
Years
The Name

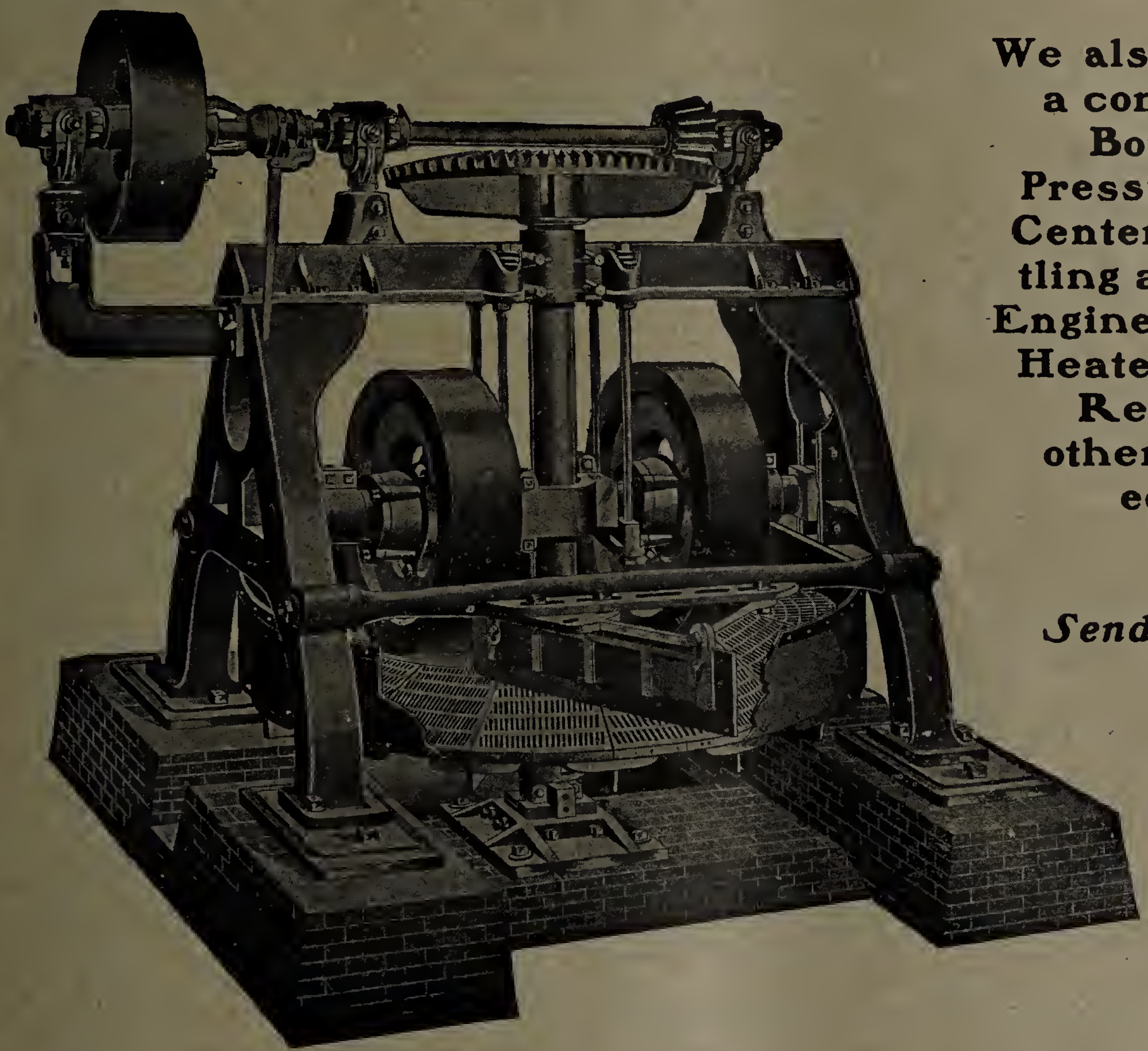
FROST

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



**We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.**

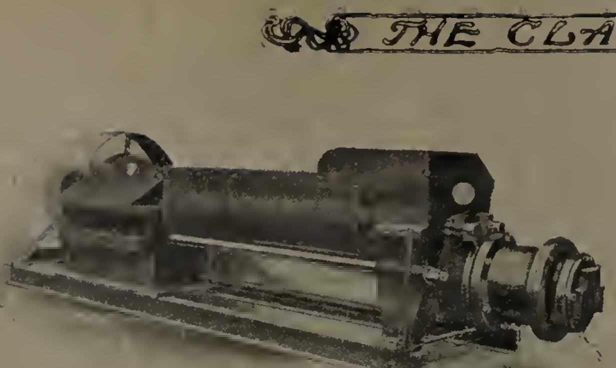
Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO." Chicago.

Mention The Clay-Worker.



The Wise Man of FATE

The Fate

Special Premier Machine

Will Enable YOU to Make Perfect Hollow Ware and Accomplish this at a Living Profit

Failure to make merchantable hollow ware may be attributed to the machine as often as to the clay or to the man that manipulates the clay.

Makeshift machinery won't do it. Hollow ware machines must be HOLLOW ware machines, and this is WHY the Fate Special Premier Hollow Ware Machine is making a profitable product out of a clay that is declared to be difficult to handle.

"The Fate Special Premier"

Will Make Hollow Ware at a Living Profit, Because:

It has the proper mixing chamber with the specially designed knives to give just the right mixture to the clay—absolutely necessary to the manufacture of salable hollow ware.

It has the proper "force" to the clay to enable it to fill out all the mold and deliver to the off-bearing belt a perfectly made ware.

It has the properly designed dies.

It has stability.

It has durability.

It has the maximum of productiveness at the minimum of cost.

The Clay Product Co., Brazil, Ind.

Proves This Statement to be TRUE!

This concern—one of the largest and most successful clay product plants in the United States, is making hollow ware with a "Fate Special Premier Hollow Ware Machine."

Two of these big "Premiers" are used on making conduit ware—one of the most difficult of wares to manufacture, because of the exacting conditions.

Not only must this ware be symmetrical, both inside and out, but the ends of the ducts must be perpendicular to sides. Then, too, there must be no projections or defects which will weaken the conduits, or which will prove an obstacle in pulling cables through the ducts. All duct holes must be well centered and all duct walls must be of a specific thickness.

The multiple ducts must have dowell pinholes for perfect alignment so that each hole will fit perfectly and be interchangeable in all parts.

No other machine will give such a uniform ware as the "Fate Special Premier" and, at the same time permit a living profit, and the Clay Product Company has proven this to their own satisfaction.

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

- ☐ Auger Brick Machinery.
- ☐ Hollow Ware Machinery.
- ☐ Conveyors.
- ☐ Crushers.
- ☐ Elevators.
- ☐ Clay Feeders.
- ☐ Disintegrators.
- ☐ Pug Mills.
- ☐ Clay Testing.
- ☐ Full Equipment.
- ☐ Industrial Locomotives.
- ☐ Drain Tile Machinery.

Name ....

Town .... State ....

You Can Do the Same

If the "Fate Special Premier" will make conduit ware successfully it certainly can make any hollow ware at a profit.

We have a special bulletin on hollow ware machinery—why not send for it and investigate a little?

We Make Everything For the Clayworker

"The House of Fate" manufactures everything a clayworker uses—and every machine or device is designed for its special purpose just as are "Fate Special Premier Hollow Ware Machines."

There are no makeshifts in Fate machinery—no patched up machines "to answer a purpose."

Let Fate's Experience Help You Our various departments are at your service in any of the problems that confront you.

Give us a frank statement of your needs or requirements and let us make you a proposal. You do not have to buy or agree to buy anything.

Use the Coupon At the left there is a coupon. Check off the items you are interested in and stick this coupon to your letter head, or to a slip of paper, and mail it today.

The J. D. Fate Co.

242 Riggs Avenue PLYMOUTH, OHIO

The Wise Man of FATE

"The Plymouth"

Will Do YOUR Haulage Cheaper and Better than Man, Horse, Compressed Air, Steam, Electric or ANY OTHER Gasoline Locomotive.

This statement is not an idle one. It is made as a positive statement of FACT and broad as it may SEEM to you, we give you the assurance that it is backed up by the PROOF of "Plymouth" users and that we are going to convince you by showing you this proof.

"The Plymouth"

Will Do Your Haulage Cheaper and Better, Because—

It Uses Gasoline—the most economical of ALL Fuels.

It uses the "Plymouth" Friction Drive, which gives MORE power, per unit of energy, a greater FLEXIBILITY of operation, a LIMITLESS number of speeds—the same forward, the same backward, a quicker PICK-UP of loads, and a greater freedom from JERKS and STRAINS, than does ANY OTHER system of transmission.

It uses a HEAVIER frame, which gives it greater TRACTION power and enables it to PULL MORE per horse power, and to take greater and higher GRADES than any other locomotive of the SAME horse power.

Frank Fleigle, Morrisonville, Illinois

Says This Statement is TRUE!

This is Mr. Fleigle's 8-year-old son, who operates "The Plymouth."

Mr. Fleigle has had a "Plymouth" in actual use about 18 months, the locomotive replacing dump cars drawn by horses, and because of the short haul he has (300 feet) and the 10 per cent grade he has to negotiate, we select his case as a fair one for evidence.

Certainly, if "The Plymouth" can be of a profit to a small plant like that operated by Mr. Fleigle, it ought to be profitable to a larger plant. Read what he says:

"We find that the 'Plymouth' is costing us for fuel about HALF to feed the two horses we formerly had.

"At one time we used a drum hoist with electric motor, but this required a man with a horse to set the empty car in the pit, and we have proven that the 'Plymouth' not only is cheaper than the horse and dump cars, but also cheaper than the hoist.

"My 8-year-old son runs the 'Plymouth,' easily starting and stopping without trouble, even on a 10 per cent grade. Our repair bills for the past 18 months have been less than $1. Our candid opinion of the 'Plymouth' as a load-pulling locomotive is that it cannot be beaten."

We Have a Big Book of "Plymouth Facts"

You ought to learn all about the "Plymouth" because it may open your way to a real profit in your business.

We have a book which tells all about the "Plymouth," and also by illustration and letters from users shows just what it is doing for other clayworkers.

Get ALL the Truth

Send for this book—a copy to you for the asking, and then act as judge. It is full of FACTS—and it is FREE.

Send Coupon

At the right there is a coupon—it is placed there for YOUR convenience. Sign it, place it in a letter and mail it TO-DAY, or, if you wish, write us a letter and state just what your haulage conditions are and we will send not only the FREE book, but also make you a proposal.

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

Firm Name (Firms) ....

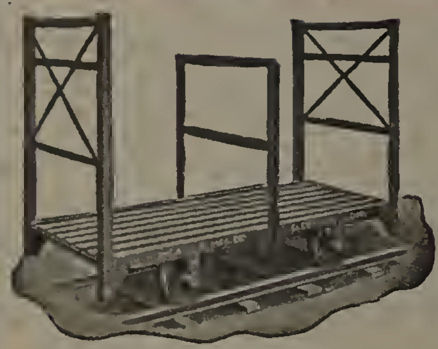
(Signed by) ....

(City) ....

(Street) ....

(State) ....

The J. D. Fate Co., 242 Riggs Ave. Plymouth, Ohio



REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

ATLAS
High Efficiency
Cars and
Electric Locomotives

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

Storage Battery Locomotive for general use.

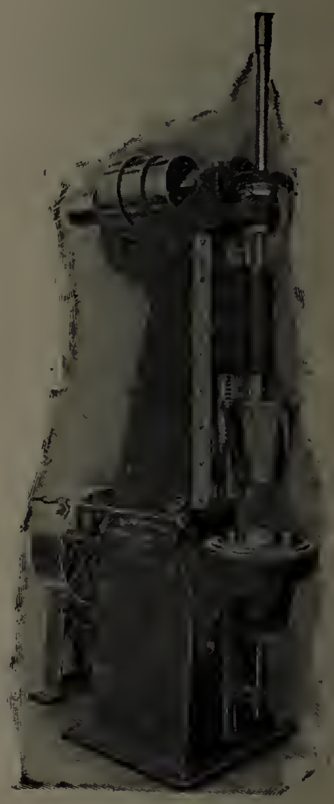
will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

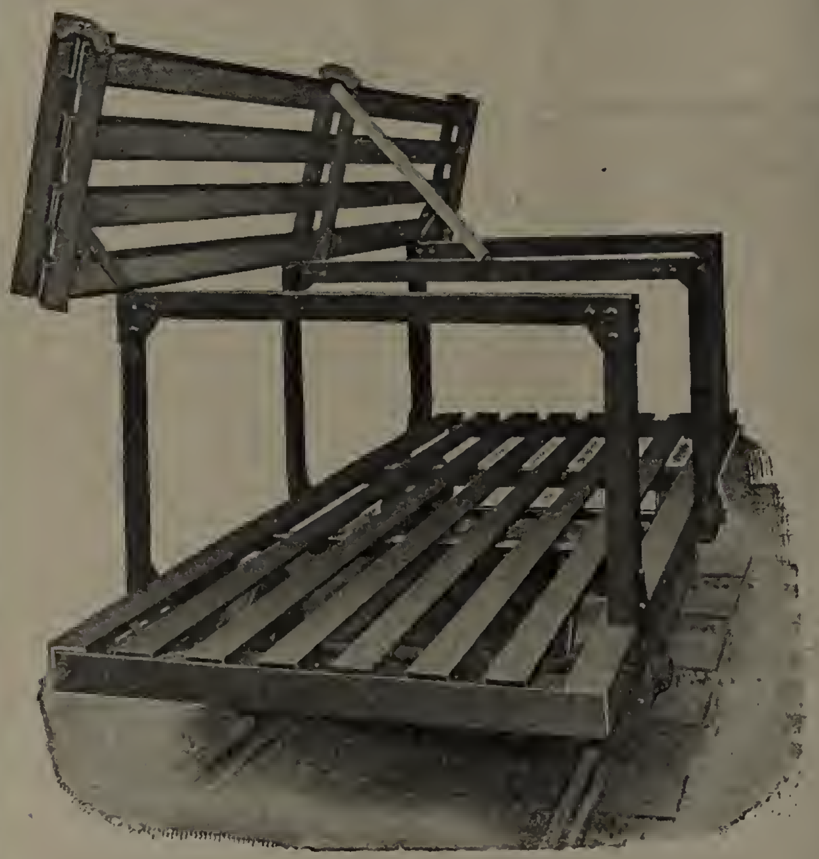
BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information



Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.



With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

LAKEWOOD NO. 166

Dryer Cars
Rack Cars
Dump Cars

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

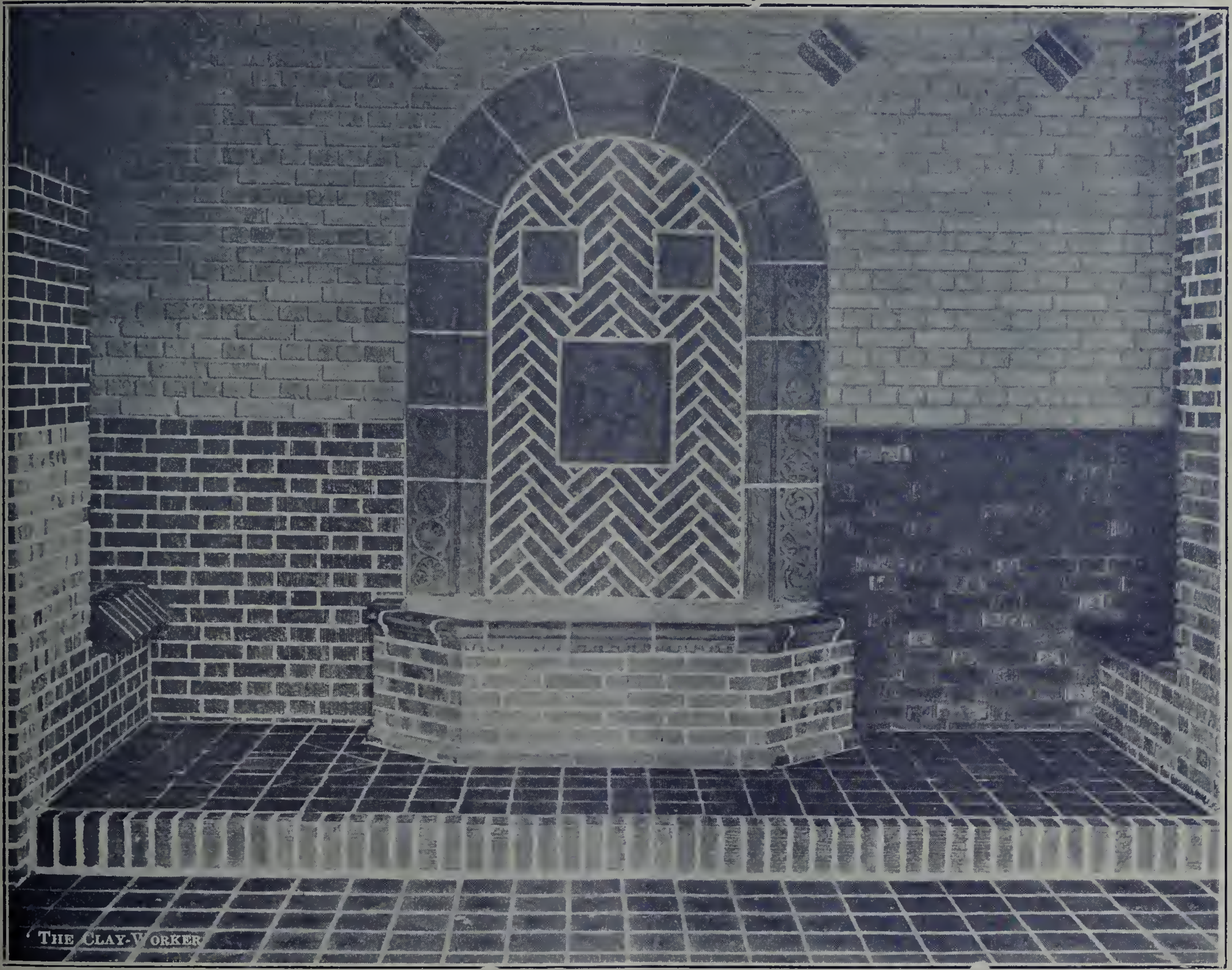
The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

Chicago: 506 S. Canal St. Pittsburgh: 1230 Fulton Bldg.
New York: 30 Church St., Room 802.
Baltimore: Munsey Bldg. Kansas City: N. Y. Life Bldg.

OF THE
UNIVERSITY OF ILLINOIS

FEBRUARY, 1916

THE CLAY-WORKER



Beautiful Brick Panel in Display Room of the Hydraulic Press Brick Co., Cleveland, Ohio

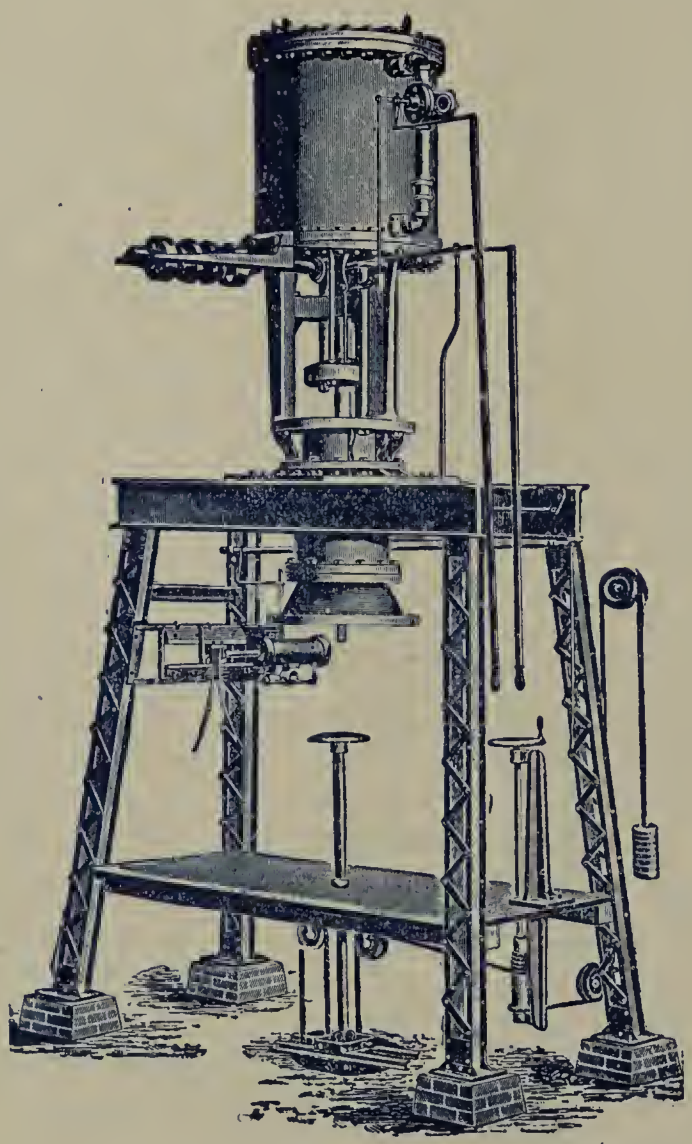
Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

TABLE OF CONTENTS
Page 200

BUYERS' READY REFERENCE LIST
Pages 135, 137, 139 and 140

INDEX TO ADS
Page 212

All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.



ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC. Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.

We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

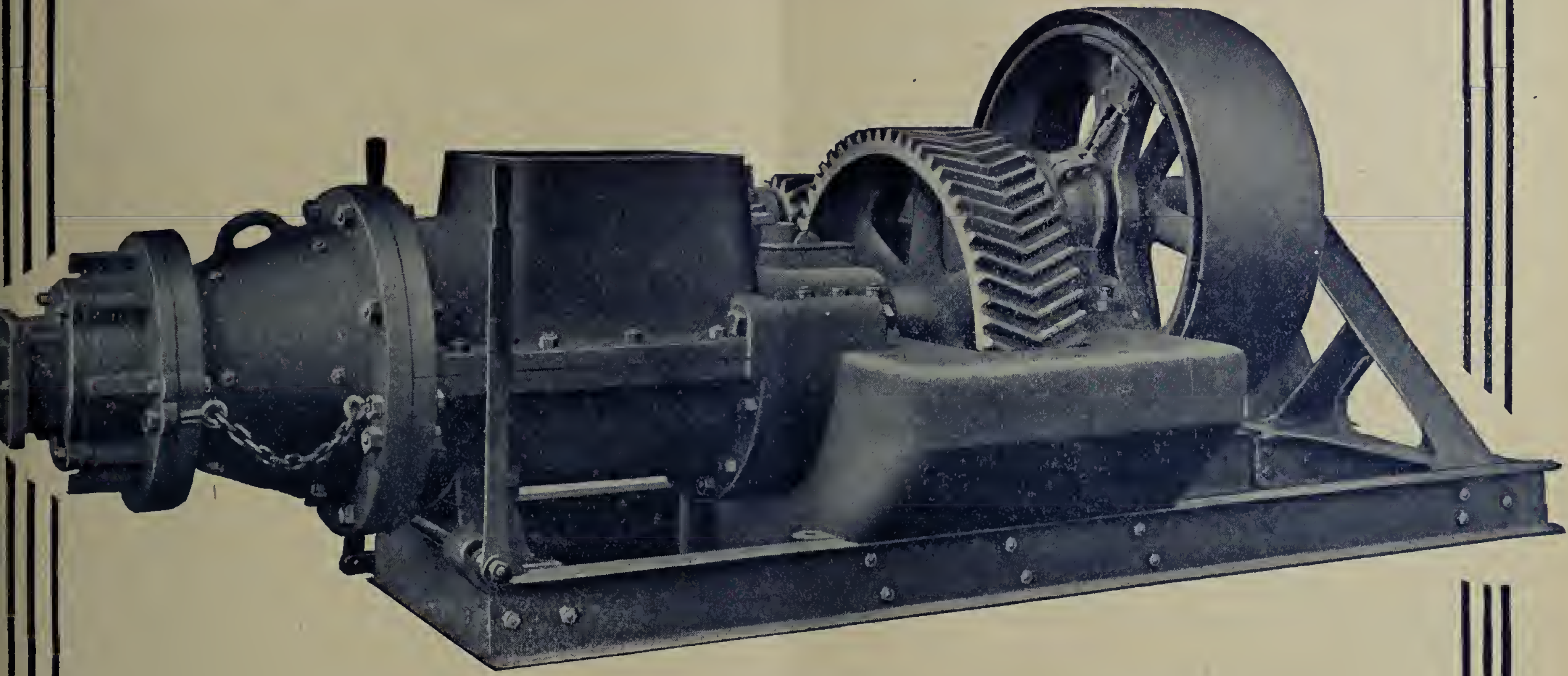
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.

THE BONNOT COMPANY

CANTON, OHIO

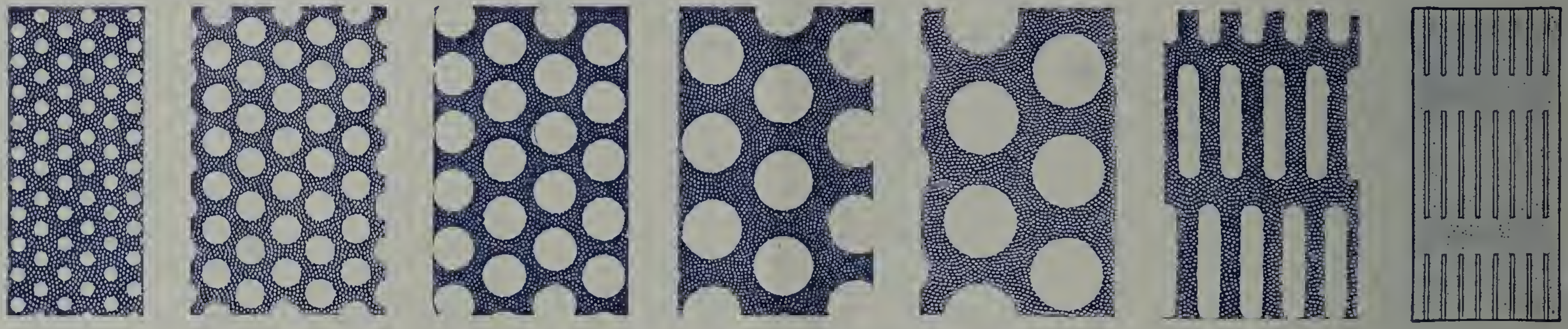
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

In Foul Weather or Fair the Mathews

**Gravity Brick Conveyer
Is always on the job**

It never tires—never shirks—never complains—never goes on strikes—never lays off—always on hand after pay day. It has no likes nor dislikes—will handle rough common brick or smooth face brick—large building units or round drain tile—heavy paving brick or hollow blocks—anything that will run on ball-bearing rollers.

Main Office and
Factory:
ELLWOOD CITY, PA.

SPEED
MATHEWS GRAVITY CARRIER COMPANY
The Mathews Way
The Saving Way
ECONOMY

Branch Factories:
TORONTO, ONT.
LONDON, ENG.

RODGERS

RODGERS FOR DRYERS

YOUR PRODUCT AND PROFIT---

satisfied with BOTH, are you?

If not, and it's the **PRODUCT** that's below standard, let's "get together" and talk over its shortcomings. When we know what they are we can help you out, for we are

Product Perfecters.

Or if it's the PROFIT with which you are dissatisfied---if due to the cost of production of your Product---again we can help you out, by proving ourselves

Profit Producers.

The most profitable production of as perfect a clay product as can be produced---with a given clay---always results when dried in a specially designed

Rodgers Waste Heat Dryer.

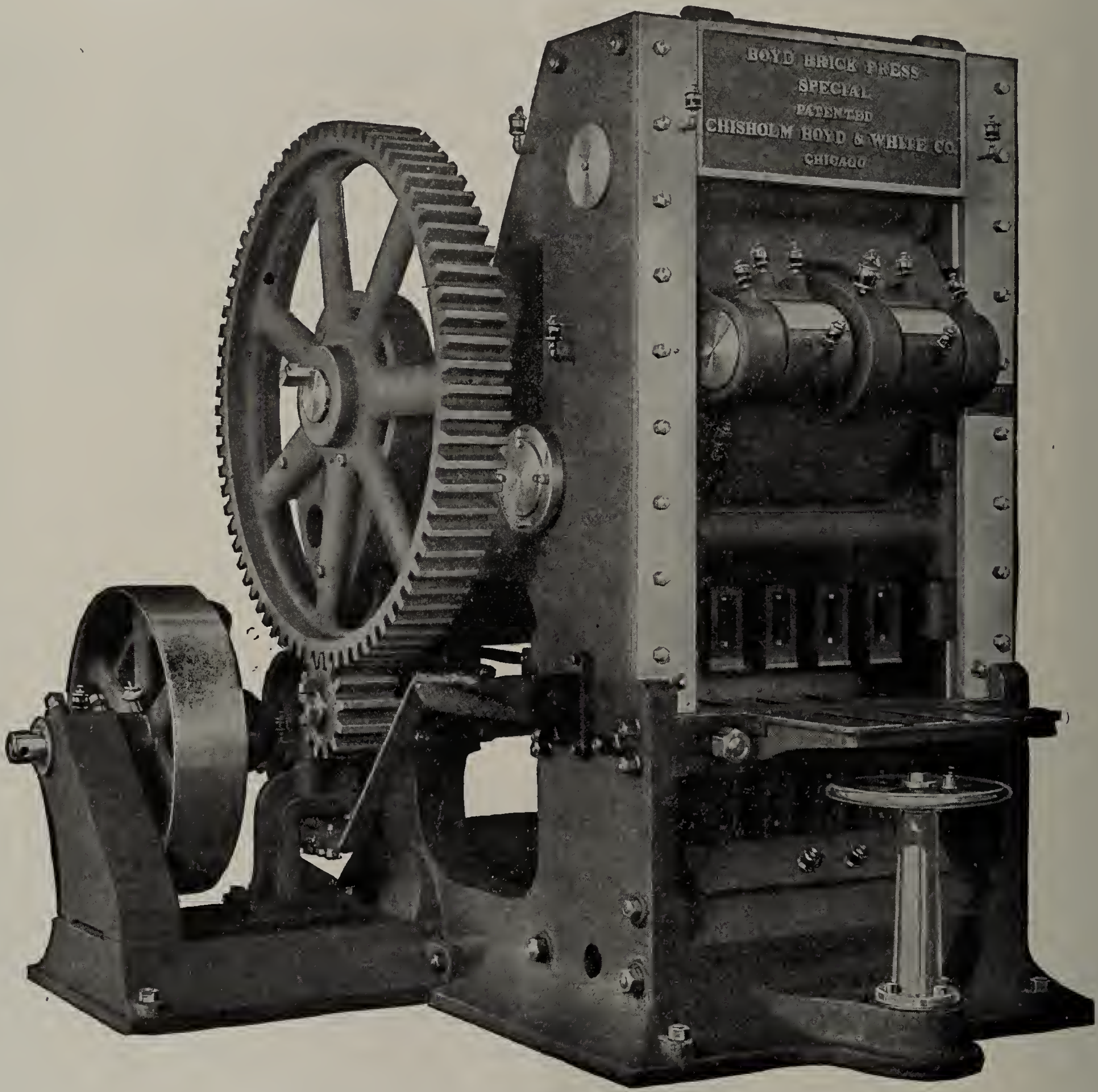
L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
Brick Works Engineers
Largest Manufacturers of Brick Drying Equipment in the United States
General Offices and Works

O
H ZANESVILLE, I
O

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Buyers Ready Reference List.

To Find Any Particular Firm or Advertisement See "Index to Ads" as Cited on Front Cover Page.

Ammeters.

The Brown Instrument Co.

Analysists and Chemists.

Ceramic Supply & Con. Co.
N. J. State University.

Arch Cutting Apparatus.

Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.

Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.

(See Cutting Tables.)

Barrows and Trucks.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
H. Brewer & Co.
Carnell, Geo.
Chambers Bros. Co.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.

Roessler-Hasslacher Chem. Co.

Bearings, Roller.

(See Supplies.)

Belting.

Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Blowers.

American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.

American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.

Brick (Building).

Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).

Parker-Russell M. & M. Co.

Brick (Paving).

Alton Brick Co.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
Mayer Brick Co., C. P.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Mchy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Fernholtz Brick Machy. Co.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Soft Mud).

American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Martin Brick Mch. Mfg. Co., H.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).

American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Dry Press).

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
Fernholtz Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.

International Clay Mach. Co.

Brick Setting Machinery.

American Clay Machinery Co.

Buffing Machinery.

American Clay Machinery Co.

Burning and Drying Systems.

American Clay Machinery Co.
American Blower Co.
Boss, John C.
F. W. Dennis.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.

(See Dryer and Dumping Cars.)

Carbide Coating.

Stowell, E. R.

Castings.

American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.

Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Clay Crushers and Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Phillips & McLaren Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clays.

American Clay Machinery Co.

Clay Dryers.

American Process Co.
Schaffer Eng. & Equip. Co.

Clay Feeders and Mixers.

American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.

(See Scrapers.)

Clay Steamers.

American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.

American Clay Machinery Co.
Fate Co., The J. D.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.

(See Supplies.)

Coloring Materials.

Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.

Orton, Edward, Jr.

Consultnig Engineers.

Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.

American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.

American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.

Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Couplings.

(See Supplies.)

Cutting Tables (Brick & Tile).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.

American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.

(See Supplies.)

Dies.

(See Supplies.)

Disintegrators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.

Ceramic Supply & Con. Co.

Drain Tile Machinery.

(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.

(See Supplies.)

Dryers.

American Clay Machinery Co.
American Process Co.
Boss Co., John C.
Chambers Bros. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Richardson-Lovejoy Engr. Co.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

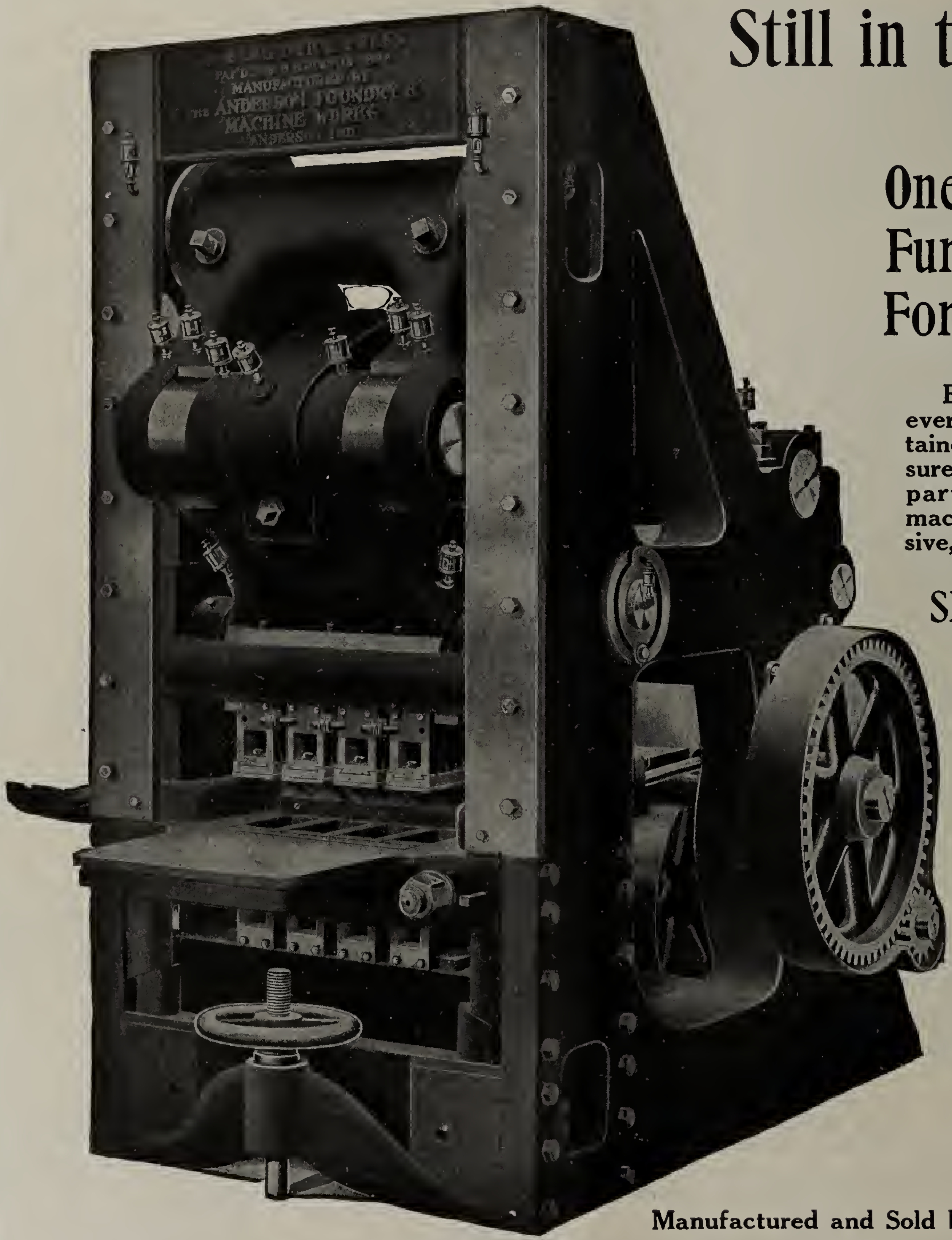
Dryer Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.

(Continued on page 137.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

Sold by the C. W. RAYMOND CO.
Dayton, Ohio

ANDERSON, IND.

Buyers Ready Reference List—Continued.

Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.
Wellington Machine Co.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Louisville Machine Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Brown Instrument Co., The
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

Elevating Equipment.

(See Conveyors.)

Engines.

American Clay Machinery Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Lovejoy, Ellis.
Rodgers Engr. Co., The L. E.
Schaffer Eng. & Equip. Co.
Trautwein Dryer & Engr. Co.

Fans.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

Filter Presses.

American Clay Machinery Co.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Fire Brick and Fire Clay.

Parker-Russell M. & M. Co.

Floor Tile.

Chicago Ret. & Fire Brick Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

Brown Instrument Co., The
International Clay Mach. Co.

Gas Fire Continuous Kilns.

Raymond Co., The C. W.

Gears.

(See Supplies.)

Granulators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Grates.

American Clay Machinery Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.

Gravity Carriers.

Mathews Gravity Carrier Co.
Taplin-Rice-Cerkin Co.

Gravity Haulage.

American Clay Machinery Co.

Grouter.

Marsh-Capron Mfg. Co.

Hand-Power Presses.

American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Stevenson & Co.

Hand Winch.

(See Supplies.)

Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Illustrators.

Lamb, J. & R.

Insurance.

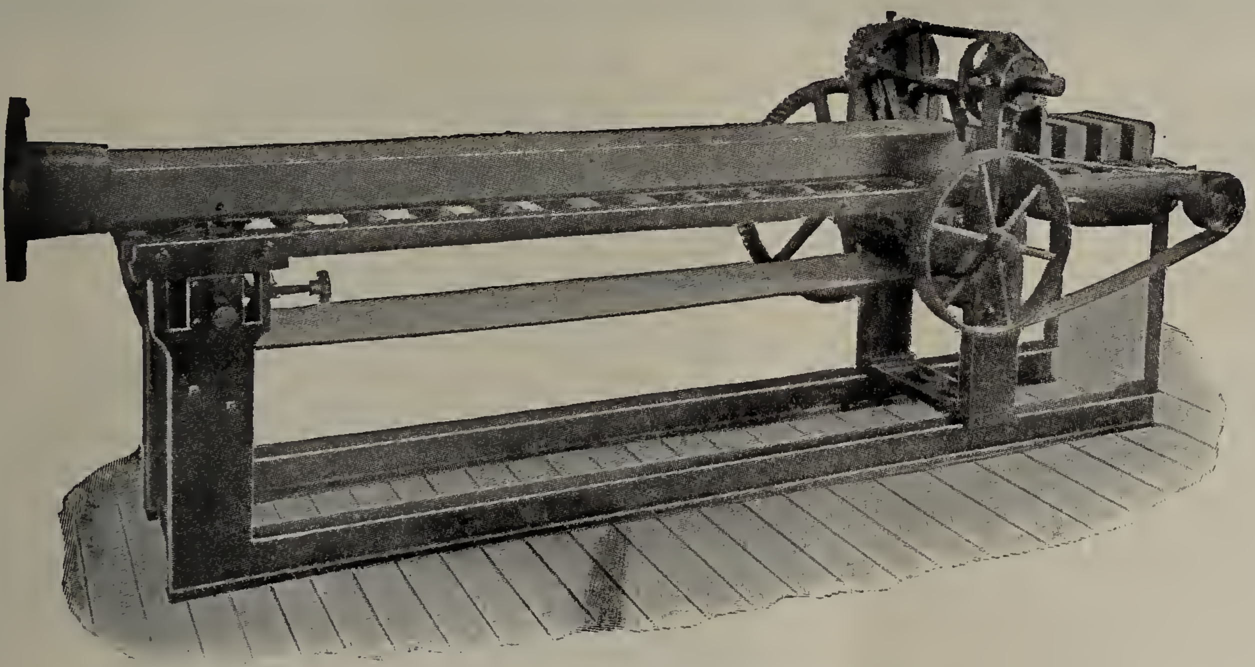
Mantel, Tile and Grate Monthly.

Jacks.

(See Supplies.)

(Continued on page 139.)

MUELLER'S NEW AUGER BRICK MACHINERY



Auger Brick Machines of most advanced design, in capacity from 8,000 to 60,000 per day.

Horsepower Brick Machines, Hand Plunger Presses for drain tiles, hollow blocks, etc.

Smooth Roll Crushers, with two and three rolls, Breakroll Crushers for hard shale.

Pug Mills, single or double shaft, for any capacity, Automatic Feeders.

Automatic Brick, Block and Drain Tile Cutters.

Hand tables for all kinds of clay products, designers of special tables.

Complete equipment for making lockplate building blocks, coupling building blocks and other hollow wares.

ROOFING TILE MACHINERY

Revolving Presses, Trimming Presses, Hand Roofing-Tile Presses, molds in plaster or metal.
Special Double Shaft Auger Machines for roofing tiles, and mechanically lubricated dies.
Cutting tables for shingles, promenades, interlocking, Spanish tiles etc.

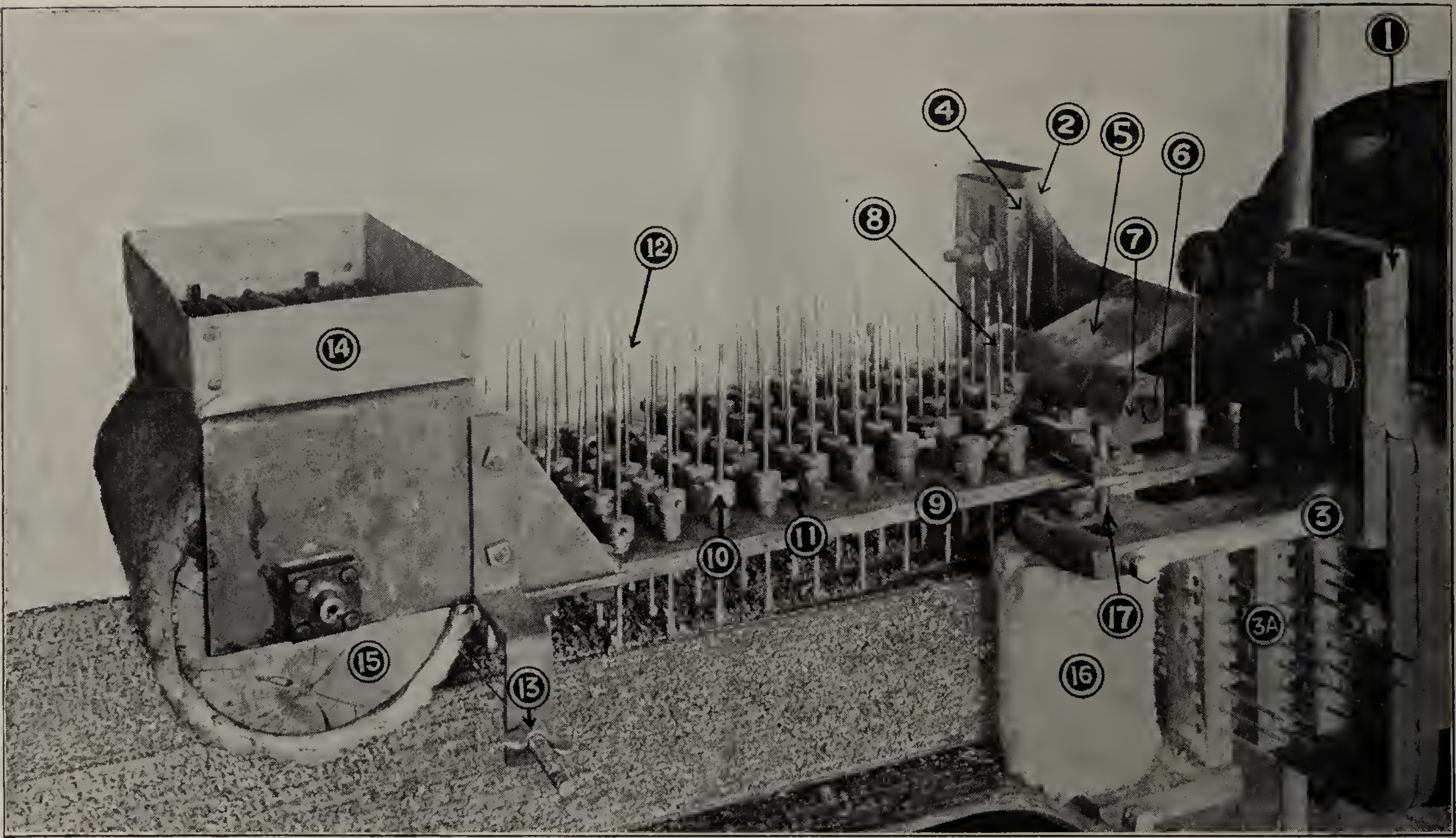
MUELLER BROS.

1436 Macklind Ave. (on Frisco Tracks) ST. LOUIS, MO.

Machine for Making RUG Brick

Patented in U. S. and Canada by D. E. REAGAN, Assignor to

Hocking Valley Products Company, Columbus, Ohio



U. S. PATENTS

No. 1,100,989	On Machine.
No. 1,101,093	On Method.
No. 46,580	On Design.
No. 1,118,681	On Brick.
No. 102,686	Trade-Mark registered on name RUG.

CANADIAN PATENTS

No. 157,727	On Machine.
No. 157,728	On Method.
No. 157,928	On Brick.
No. 82	Trade-Mark registered on name RUG.

RUG brick is favorably known everywhere.
RUG brick when properly made courts competition.
RUG brick is a boon to the brickmaker.
RUG brick and RUG brick machine are patented.
RUG brick patents are published to invite investigation.
RUG brick infringements will be prosecuted.
RUG brick license to manufacture and sell is very reasonable.
RUG brick licensees enjoy the benefits derived from
RUG brick reputation, the most popular brick in the World.

Hocking Valley Products Company

D. E. Reagan, President — COLUMBUS, OHIO

Buyers Ready Reference List—Continued.

Kilns.
American Clay Machinery Co.
Boss Co., John C.
F. W. Dennis.
Hook Patent Kiln Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Richardson, W. D.
Schaffer Eng. Equip. Co.
Smith Co., Claude.
Swift, Edward A.
Yates, Alfred

Kilns, Doors, Castings and Frames
(See Supplies.)

Kiln Bands.
Holliday, W. J., & Co.

Kiln Floor Tile.
Chicago Ret. & Fire Brick Co.

Knives.
(See Supplies.)

Locomotives.
Davenport Locomotive Works.
Dewey Bros.
Fate Co., The J. D.

Manganese.
(See Coloring Materials.)

Mechanical Draft.
American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

Mineral Paint.
(See Coloring Materials.)

Molds (Brick).
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Wallace Mfg. Co.

Mortar Colors.
(See Coloring Materials.)

Motor Trucks.
Fate Co., The J. D.

Oil Burners.
Schurs Oil Burner Co.

Paints.
(See Coloring Materials.)

Pallets.
Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).
(See Dry and Wet Pans.)

Paving Brick or Block.
(See Brick.)

Perforated Sheet Metal.
Caldwell & Sons, H. W.
Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

Pitch (Paving).
Barrett Mfg. Co.

Plows.
(See Scrapers.)

Poidometers.
Schaffer Eng. & Equip. Co.

Portable Track.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.

Pottery Machinery.
American Clay Machinery Co.
Baird Machinery & Mfg. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

Power Plant Equipment.
American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Presses.
(See Brick Machines, also Sewer Pipe Machinery, also Roofing Tile Machinery.)

Pug Mills.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Pulleys.
(See Supplies.)

Pulverizers.
American Clay Machinery Co.
American Pulverizer Co.
Fate Co., The J. D.
Taplin-Rice-Clerkin Co.

Pumps.
Ceramic Supply & Con. Co.
Dean Bros. Steam Pump Wks.
Potts & Co., C. & A.

Pyrometers.
Brown Instrument Co.
Ceramic Supply & Con. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co., The

Rails and Railway Equipment.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Ceramic Supply & Con. Co.
Davenport Locomotive Works.
Fate Co., The J. D.
Lakewood Engineering Co.

Rattlers (Paving Brick).
American Clay Machinery Co.
Ceramic Supply & Con. Co.
Freese & Co., E. M.
Hetherington & Berner.
Phillips & McLaren Co.

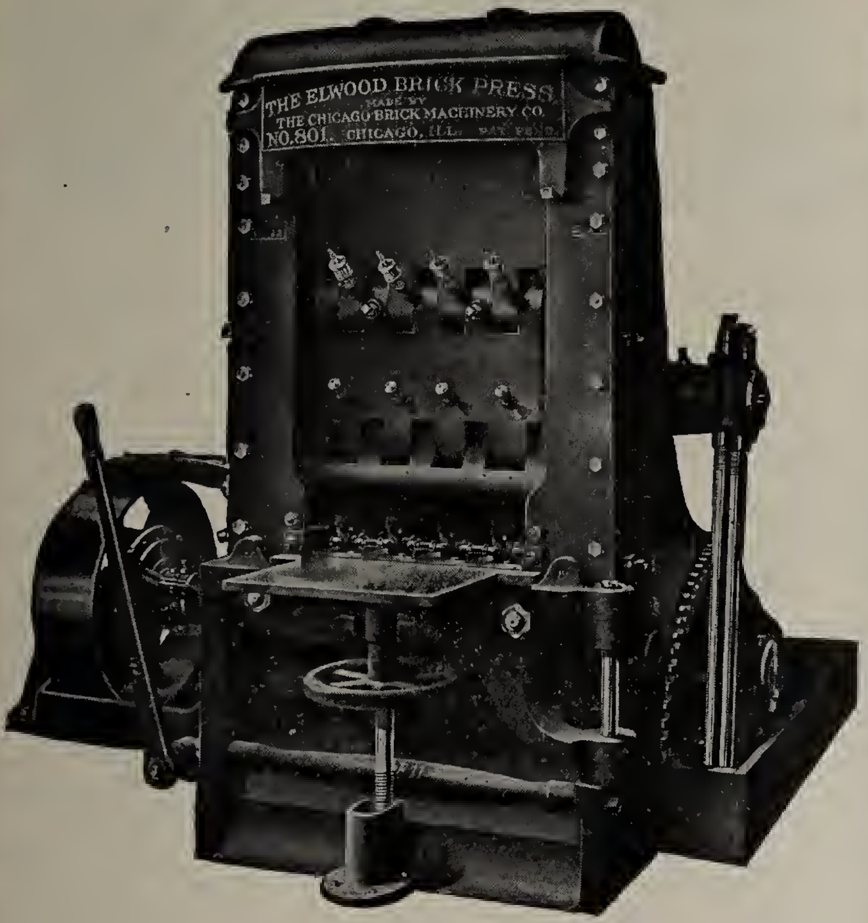
Recording Gauges.
Brown Instrument Co.
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Represses.
American Clay Machinery Co.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Revolution Indicators.
Brown Instrument Co.
Ceramic Supply & Con. Co.

Revolving Steam Shovels.
American Clay Machinery Co.
Thew Automatic Shovel Co.

(Continued on page 140.)


THE ELWOOD BRICK PRESS
MADE BY
THE CHICAGO BRICK MACHINERY CO.
NO.801 CHICAGO, ILL. PAT. PEND.

ELWOOD PRESS

BUILT FOR HEAVY DUTY.
ALWAYS MAKES GOOD.

WE ALSO HANDLE EVERYTHING
USED ON A BRICKYARD.

CHICAGO BRICK MACHINERY CO.

Sold Also by
MANUFACTURERS EQUIPMENT CO.
Dayton, Ohio.

20 W. Jackson Blvd., Chicago

Buyers Ready Reference List—Continued.

Rock Crushers.

American Clay Machinery Co.
American Pulverizer Co.
Phillips & McLaren Co.

Roofing Tile Machinery.

American Clay Machinery Co.
Fate Co., The J. D.
International Clay Mach. Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Rope.

(See Supplies.)

Rotary Dryers.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Fate Co., The J. D.
Hensley, J. W.
International Clay Mach. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.

Sand Dryer and Sand Sieves.

American Clay Machinery Co.
Ceramic Supply & Con. Co.

Sand Lime Brick Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Fernholtz Brick Machinery Co.
Lakewood Engineering Co.
Raymond Co., The C. W.

School of Ceramics.

Illinois University.
Iowa State College.
New Jersey State School.
New York State School.
Ohio State University.

Scrapers, Plows and Clay Gatherers.

Arbuckle & Co.
Lechtenberg Brothers.
Eagle Iron Works.

Screens.

American Clay Machinery Co.
Brewer & Co., H.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Harrington & King Perf. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Taplin-Rice-Clerkin Co.

Sewer Pipe Machinery.

American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Taplin-Rice-Clerkin Co.

Steam Gauges.

(See Supplies.)

Steam Shovels.

American Clay Machinery Co.
Thew Automatic Shovel Co.

Steam Specialties.

American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Steam Traps.

American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Steel Pallets.

Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Atlas Car & Mfg. Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
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(See Cutting Wire.)

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We extend to all clayworkers attending the N. B. M. A. Convention at Cleveland the week of February 21st, a most cordial invitation to visit our headquarters in Room 306 Statler Hotel, where our representatives will be pleased to welcome all visitors and go into the merits of our line of machinery and supplies, covering *The Underwood Producer Gas Burning System, The Justice Dryer, Meco Single Roll Rock and Shale Crusher,* and complete brickyard equipment.

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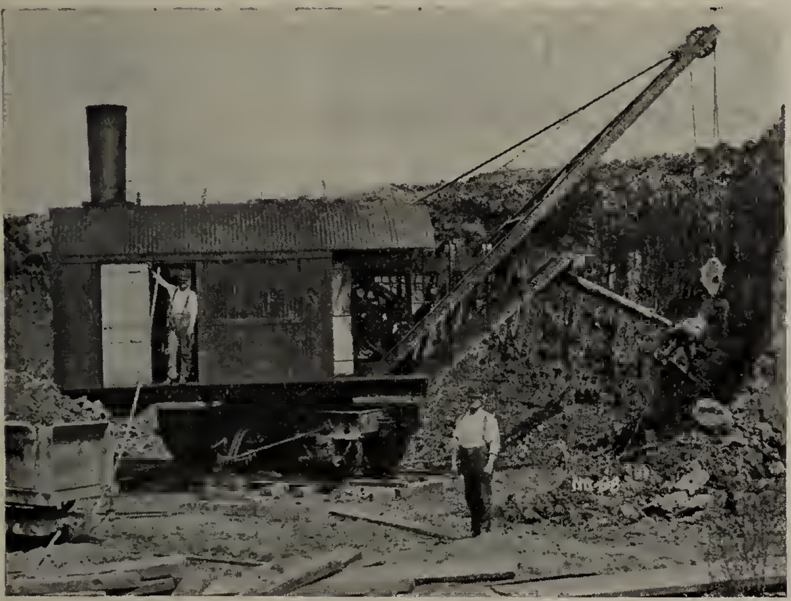

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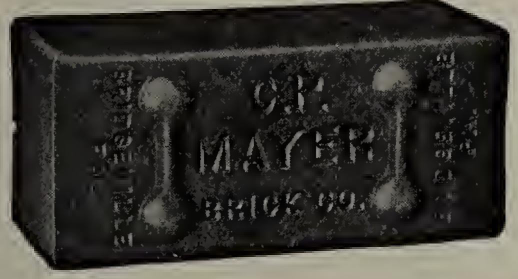

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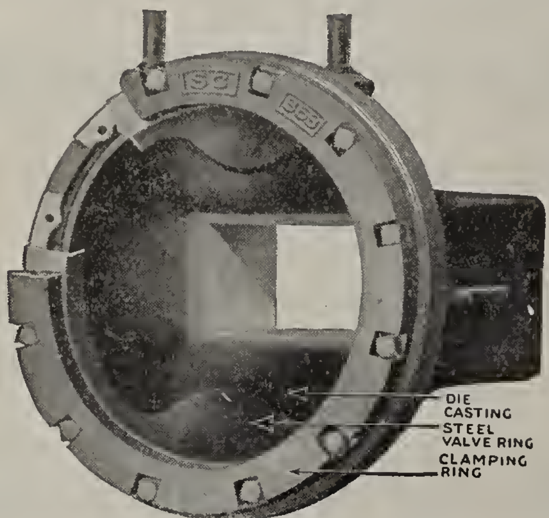

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The Chambers Lubricating Die Helps on the Rattler Test.

The lubricant is applied at the point of greatest resistance and is forced into the die under pressure. Contributes to a more uniform movement of clay bar. Gritty shales and fire clays possessing but little plasticity are molded more successfully with this die. Less power, less waste, better product. Used on various auger machines. Both side-cut and end-cut.

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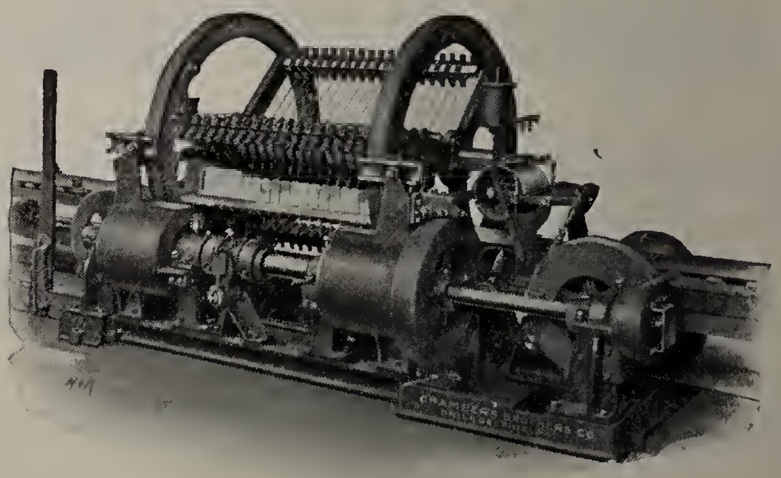

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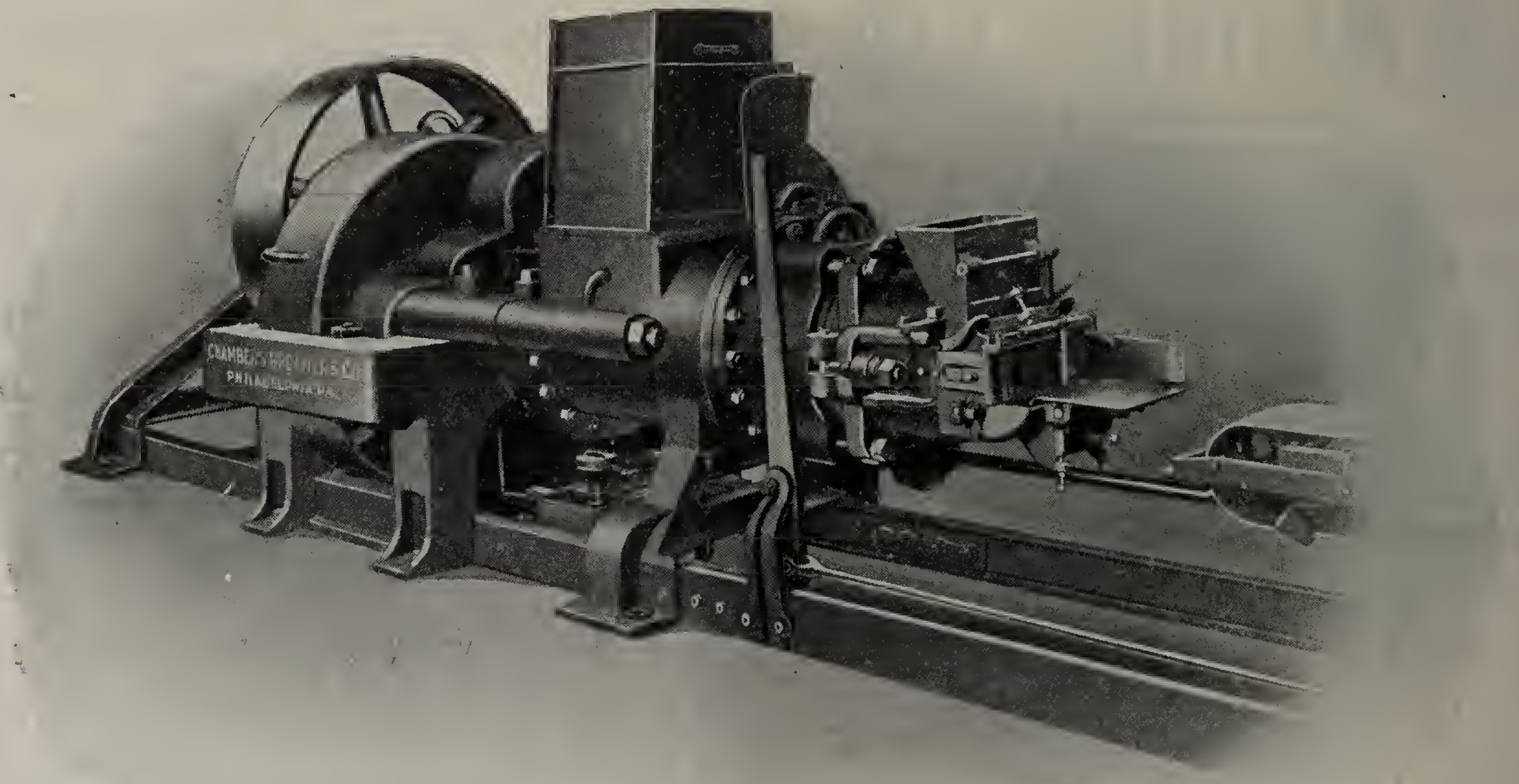

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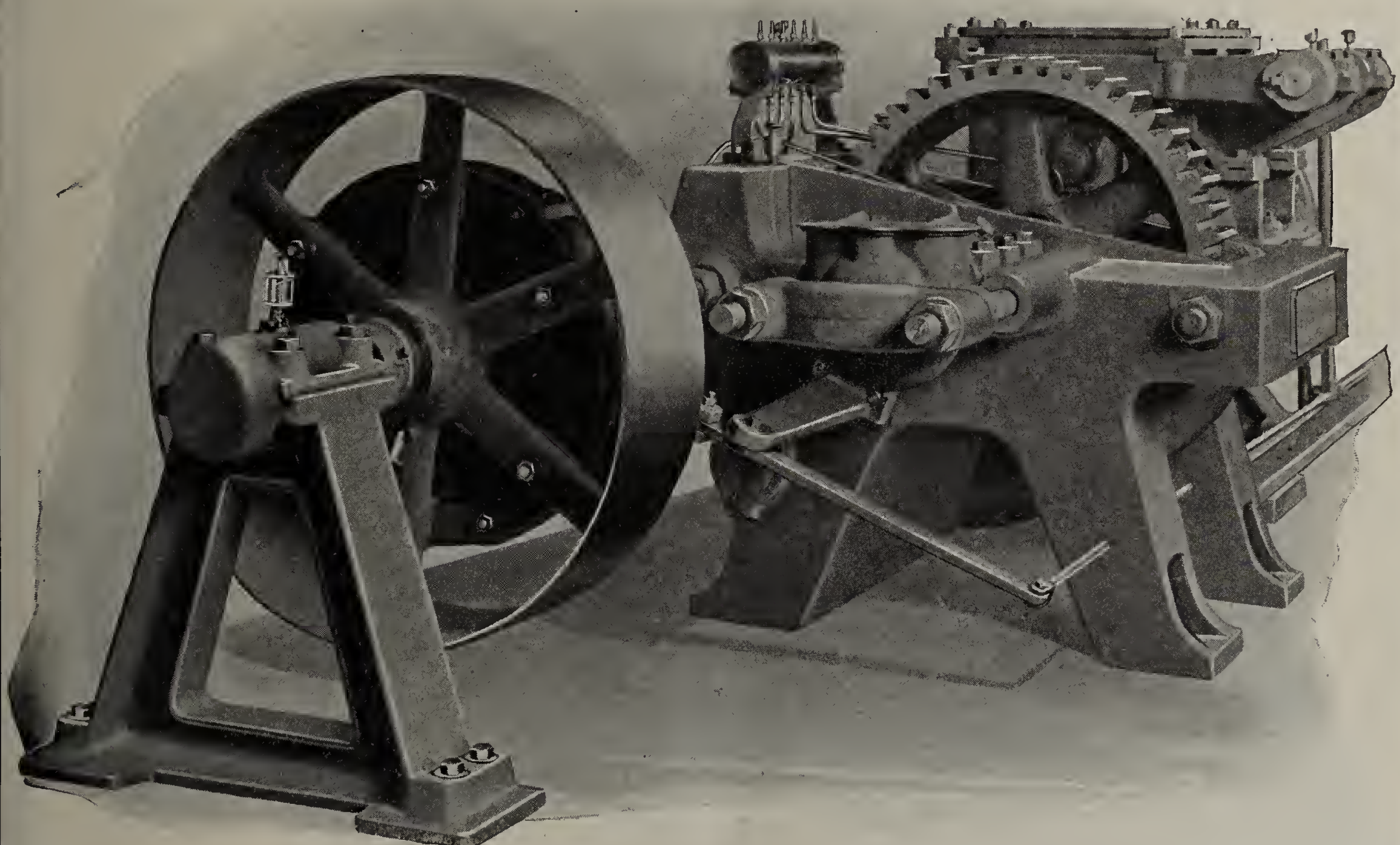

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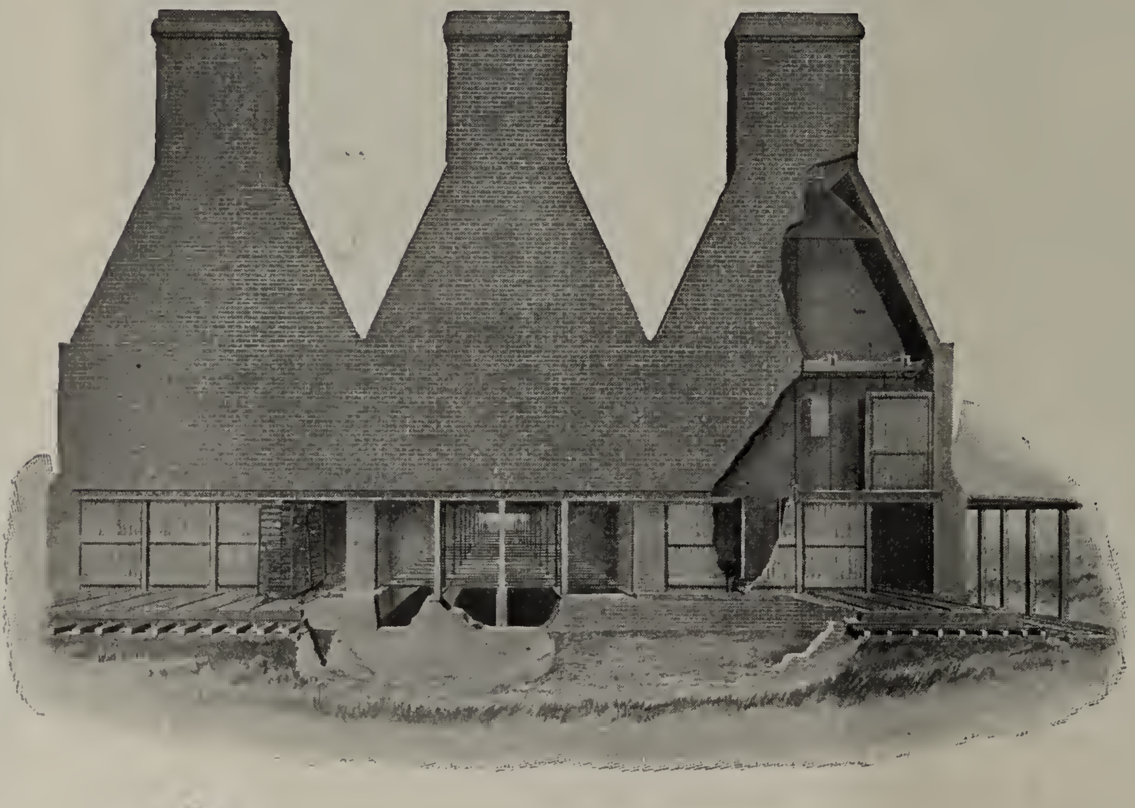

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THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXV. INDIANAPOLIS, IND., FEBRUARY, 1916. No. 2

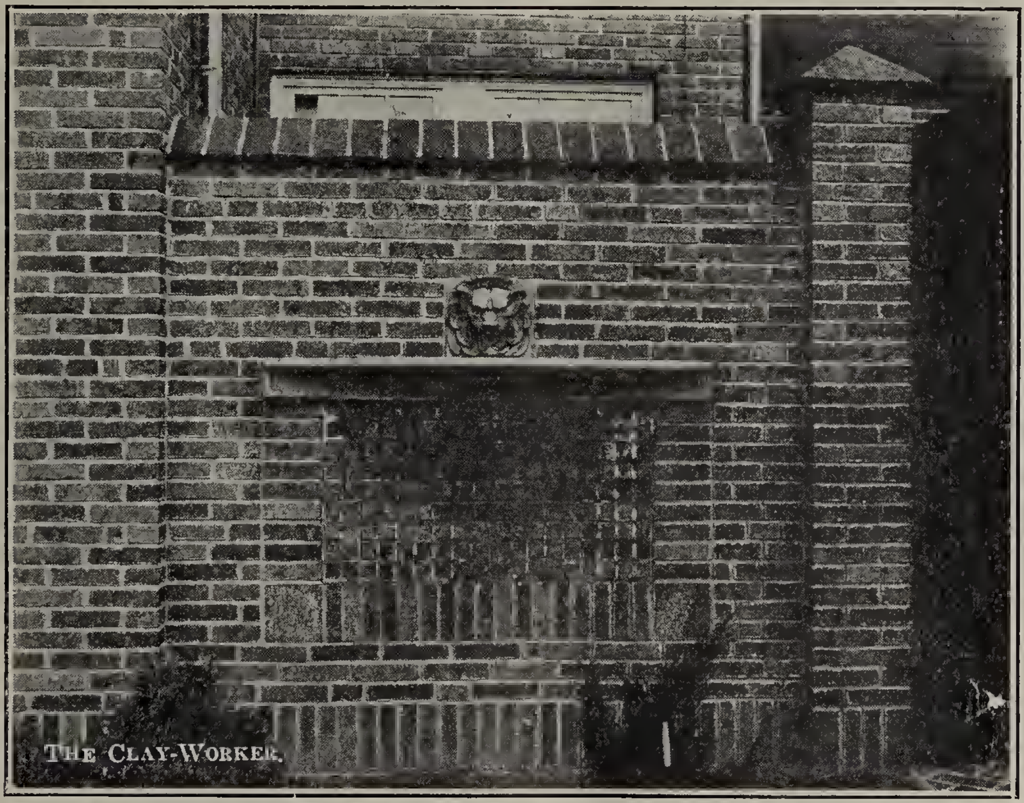
Written for THE CLAY-WORKER.

BRICK BUILT HOMES THE BEST.

Your Children and Your Children's Children Will Be Safe in a Home Made of Well-Burned Clay Products.

THERE is many a lumberman living in a brick home because no matter what his argument may be concerning his products when he is making his sales, he believes in "Safety First" and houses his family in the safest structure possible made of "well burned clay brick." Do we find many brick manufacturers living in frame houses? Decidedly no. They are of the same opinion as the lumberman when it comes to safeguarding their wife and children and they build with brick, using, of course, their own material and making their home most artistic, attractive and comfortable to live in by so doing.

There may be a few clayworkers who live in frame dwellings but it is not through choice but because of financial embarrassment. They are forced to rent and live in their frame houses because they have antiquated methods in their plants or do not know the cost of the manufacture and consequently sell their product at a loss.



The Teco Terra Cotta Fountain in Brick Wall in the Rear of Mr. Chapin's House.

The average clayworker lives in a fireproof house, made attractive by well selected brick laid artistically in the wall. Mr. F. H. Chapin, manager of the Cleveland branch of the Hydraulic Press Brick Company, is one of the many brick manufacturers who practices what he preaches. He owns a beautiful brick residence in Cleveland which is most inviting to say the least. We publish two views of Mr. Chapin's home.

This is located on a valuable site having a prominent outlook over a deep ravine that skirts the house at the back. The exterior brick work is of rough texture known as Hy-tex Oriental Bokharas 2x8½ inches in size ranging in color from dark blue through maroon and brown to deep rich red laid in straight American Bond with every sixth course alternated header and stretcher with joints ⅝ inch thickness of buffish gray mortar raked ⅛ inch. As you will note in the pictures, on pages 150 and 151, the roof is shingled (brown) bent at the eaves for thatch effect. We presume this is the only reason Mr. Chapin used shingles instead of clay tile, for the latter is, of course, the safest and best material to use.

All of the other outside woodwork except the lich gate (see illustration) and flower box are in cream color.

The bird fountain in the wall between the house and the garage is "Tecco" green terra cotta. The walks are all laid in red brick, laid "herring bone" with natural cement joints. The pergola floor is of Hy-tex Rug tile in varied colors of brown and reds.

The house is well arranged with large rooms, affording an abundance of light and ventilation. There is a large living room, dining room, sun parlor and kitchen, four sleeping rooms and two bath rooms. The living room is 16x28, furnished in natural walnut as is also the stair hall; a beautiful "Hy-tex Old English" brick mantel with swinging cranes, is a conspicuous feature of the living room. The dining room, 16x15½, is finished in Fifteenth Century oak. The sun parlor, 14x12, has a floor of 6x6 Hy-tex tile. The kitchen is furnished in natural Georgia pine. The four sleeping rooms upstairs are finished in birch stained light brown, while the two bath rooms are in white enamel.

The kitchen is located in the front of the house and screened by a seven-foot wall with the lich gate noted in the picture. The arrangement is due to the fact of the prominent outlook at the rear of the house.

This residence is indeed artistic, well arranged and substantially built. The brick work gives graphically but one of the hundreds of ways to reproduce the beautiful color effects in nature itself.

Did you ever stop to think of what wonderful color effect one can secure in brick work?

Every color mother nature spreads before us, the autumn colorings with the golden browns, reds, russets, mahoganys, yellows, and dark shades, the winter with the white of the snow or the dead colors of the trees, or the purple hazes that hang in the air on the foggy mornings, the spring all the fresh colors and bright shadings and in the summer the warm substantial hues, all these can be shown substantially in modern brick work.

What other material affords such a wide range in its adaptability, combined with strength and fire-resisting qualities? There is absolutely no other material that can rank with well burned clay products. Their beauty is unsurpassed except that it be in nature itself. Their durability is unquestioned for they have stood the test for thousands of years, the brick from the excavations of Babylon are being used in construction work in a number of the large cities today. Their adaptability has surprising possibilities, and unlike cement or lumber can be used over and over again.

Think of the beauty ,artistic brick work adds to the house, the garden walk or wall, the gates, the fountain, the den and the chimney place. And the most pleasing part of it all is it retains that beauty.

A brick house is the most economical home one can build. It costs but about ten per cent. more in first cost, and this is entirely made back by the end of the fourth year, because in a brick structure there is no repair bill, no cost for painting, you save on the insurance charges, and your fuel bill is much reduced because a brick house retains the heat. It is cool in summer because a brick wall does not allow the outside heat to penetrate and is warm in winter, because the cold cannot get through.

A brick built home is frost proof, fire proof, vermin proof and therefore the most sanitary and most satisfactory house to live in.

Mr. Chapin's Residence, Cleveland, Ohio. Needless to say, the Brick were Made by the Hydraulic Press Brick Company.

Written for THE CLAY-WORKER.

DELIVERING THE GOODS.

A BRICK structure will stand for ages or it can be taken down at will. We have had many impressive lessons, or object lessons, one should say, on the durability and permanency of brick and brick construction, many of them dating back into the dark ages of the past. We have not, however, dwelt as much as we might upon the subject of the easy removal of a brick structure at will. This phase of the matter is of importance in considering, or rather, in comparing brick construction to concrete.

An illustrative incident that covers the point here was related a short time ago by an important southern saw mill man. He said in putting up a new mill they wanted to include as many modern ideas as possible and they turned to concrete for the erection of a massive combination boiler furnace and waste consumer. They made a thorough job of it, too, at quite a heavy expense, and when they got it finished they felt it was there to stay.

It was, too, which they came to regret afterward. When they put their mill to work, they found they were mistaken in their ideas of design and that this great mass of furnace and waste consumer walls would have to come down and be reconstructed. This would have been easy had they been constructed of brick. They could have taken it down and used the brick in reconstruction. Being monolithic concrete, they had to use a drill and dynamite and do the blasting after the mill had shut down at night, and it cost them several thousand dollars to tear down the structure, and when they got it down they had nothing but a lot of rubbish that was heavy and cumbersome to remove and was worth nothing to them in reconstruction.

When a man has a product to exploit, the success of which means bettering the condition of those who use it equally with those who manufacture and exploit it, he has something he can justly take pride in and honestly grow enthusiastic about.

That is the kind of a product we have in brick—a product that makes good—and "delivers the goods."

It Delivers the Goods.

Both the business world and the general public has a wholesome respect for the man that "delivers the goods." Speaking either literally or figuratively, it is the man who is successful, makes good his promises, and manifests sterling qualities in times of stress and trial that is universally admired, and he is admired and respected even though he may have some objectionable traits. He may be a hard bargain driver, and cold-blooded in business dealings, yet if he delivers the goods he is not only respected, but people have confidence in him.

Clay products stand in the building material world where this type of man stands in the business world. It delivers the goods. Some may kick about the additional cost and some may claim that this or that material will do practically as well, and this other material does not require as expensive help to put up, and all of that, but, after all is said and done, it is clay products that "delivers the goods."

The man who builds a brick house never regrets it, but the man who builds with lumber or concrete often wishes he had built of brick. The man who has the regrets is the one who balks at the price or at the cost of the skilled labor involved in laying up brick work, and thus fails to get it. The man who recognizes it for what it is worth and insists on using it never has to nurse vain regrets, because it delivers the goods, and the satisfaction of a job well done remains with him long after the price is forgotten.

There is right in this a splendid line of argument to use on the prospective home builder who is straddling the fence and is halting and hesitating about whether he will strain a point and build with brick, or whether he will strive to get along with lumber or some seeming cheaper material that proves more expensive in the end and fails to give satisfaction or "deliver the goods" like brick.

Front View of the Chapin House. Note the Brick Walk, Brick Wall and Fountain.

Written for THE CLAY-WORKER.

THE PROBLEM OF POTTERY CLAYS.

THE WAR in Europe, because of its interruption of imports, has caused some apprehensions as to a supply of certain clays needed in the pottery business, which heretofore came mainly from Germany and Belgium. Incidentally, it is leading in this, as in the case of our dye stuffs, to very active efforts to develop our own resources, so that we may be independent of the outside world in the matter of this raw material.

Public statements and inquiries touching on this point have led the Department of Commerce to make an investigation. The subject was referred to Prof. A. V. Bleininger of the clay products section of the Bureau of Standards some time since, who pointed out that the main trouble is in connection with the manufacture of glass parts, tank blocks, graphite crucibles and similar refractories which require a certain amount of plastic clay for bonding the other material. These requirements are very exacting and heretofore most of the clay for this purpose of desirable kind being easily available from Germany and Belgium we have depended upon this more than we have turned to the developing of our own possible resources. We have been managing to get some imported clays, the imports for a period of ten months, during 1915, showing a total of $1,689,254, as compared to $1,808,542 for the same ten months of 1914. From this it would seem that notwithstanding the interruption to commerce we are managing somehow to get a reasonable quantity of imported clay, enough perhaps that there is really no particular danger of anything in the form of an industrial disaster because of lack of this clay.

The important point, however, that should have continued serious attention is that this is directing effort toward the developing of some of our own country deposits. We have found it possible to use in many places a mixture composed of a large quantity of American plastic clay from the St. Louis territory and a smaller quantity of the imported clay with satisfactory results. While no American clay, so far found, has proven to be a perfect substitute for the gross almerode and related clays even though it may have other properties that are superior it is thought probable that we may find something equivalent sooner or later. Moreover while seeking for this it is found that the same problem can be solved by using a mixture of several American clays either of which contributes its share toward the development of a suitable structure. In this way the deficiencies of any one clay may be compensated for by others. There is nothing new about this idea either, for it is one that has been followed in Germany for a long time.

Speaking of the sources of plastic fire clay in the United States, Professor Bleininger says there are available besides the Missouri clay a very strong and refractory clays in Tennessee and Kentucky, more siliceous, but exceedingly plastic materials in Arkansas, excellent soft fire clays in Pennsylvania and southern Ohio, several ball clay-like deposits in southern Illinois, and the various plastic refractory materials of New Jersey. These clays represent a considerable range of properties, and when suitably combined should give results closely approaching those obtained by the use of the European clays.

While the war has caused some apprehension and trouble in this connection there will perhaps come out of it all a great future benefit because it has turned us to doing something we should have done long ago, the seeking in our own country for things we need and to developing our own natural resources. This in time should prove a greater benefit to the industry than any inconveniences that is likely to be caused through war's interruption of imported clays.

KEEPING BOOKS ON MACHINERY.

THE CLAYWORKING fraternity should be particularly interested in the subject of bookkeeping in its application to machinery, because in this industry the wear and tear on machinery is more severe than in many other industrial lines, and it is important to proper cost accounting to know with some degree of certainty the annual wear and tear on machinery and how to keep account of it.

The expert accountants have led us into ways where there are danger signals flying, however, and while we need the assistance and advice of expert accountants, it would seem from a number of incidents which have come to light that the accountants themselves need to take a broader and more comprehensive view of the subject of keeping books on machinery.

This thing of charging off a heavy per cent. for depreciation each year is a splendid idea when viewed from the angle of safe bookkeeping in the matter of cost; but it is a dangerous thing when a fire occurs and the insurance adjuster comes around, or where there is a proposition up to sell out the plant, and you start in to appraise it from your book records.

This is really the gist of the present matter, to get after this subject of depreciation and to hang out a warning and give a bit of advice.

Those who have studied the subject and pose as experts claim that machinery depreciates after the first year at varying rates, depending upon its nature and the line of work. Some set the depreciation for machinery in the metal-working industry at 5 per cent., some at 7½, some take the general industrial machinery list and claim that 10 per cent. should be charged off each year for depreciation, and still others take the industries like clayworking, where the wear and tear is unusually severe, and argue that a depreciation of 15 or 20 per cent. should be taken off each year. This higher percentage applies to several lines of work, including clayworking, rock-crushing, quarrying and contracting machinery.

Our quarrel here is not with the idea that the machinery wears out, and some account should be taken of this, but rather with the method by which it is sometimes handled. If one simply goes to work and charges off at the end of each year, say 15 per cent. for machinery depreciation from the original cost, it is only a few years until the value of the plant equipment has practically been eliminated so far as the annual inventory on the books is concerned.

This may be clean and safe bookkeeping so far as insuring correct cost accounting is concerned, and clean profits, but it is a bad snag to run against at other times. One instance that the writer met up with during the year was where there had been a fire, and when the insurance adjuster came along and wanted some specific statement of the number of machines and their value that had been damaged, it suddenly occurred to the manager that they had charged off depreciation on this equipment until it didn't show much value on their annual inventory. Naturally, he didn't want the insurance man to get a peep at this, and he had quite a time making up an inventory in keeping with what he considered the real value of their equipment.

Something of the same trouble could easily occur if one were selling a plant or seeking to borrow money on the equipment by which to enlarge his business. This would call for a definite appraisement of the plant, and if those appraising are to take their figures from the inventory values shown on the books, it is important that the book value represent the actual value of the equipment at the time rather than to show a depreciation charge which has practically wiped out that value.

The real way to inventory a plant for the machinery equipment is to go over it and appraise it with expert judgment each year. The judgment would have to take into consideration the value of the machinery as it stands, to be operated in the future right where it is, and not what it might be sold for if the plant were to be discontinued and the machinery thrown on the market.

It is the writer's opinion that the best system of all in keeping books on machinery would be to let the original inventory of the plant and equipment stand. Then, instead of charging off a certain per cent. for depreciation each year, create instead a fund for repairs and maintenance and make the basis for this fund the equivalent for the percentage which would logically be charged off for wear and tear on machinery. By following this method the original inventory, of course, stands as it should stand. It is the original cost that is the basis for insurance policies and for appraisement generally, and as a general thing these insurance policies are continued on the same basis. And, really, a plant that is kept up to its work right should retain its full value right along. From the fund so set aside one does repairs and buys new machinery now and then. This may call for some changes in the original inventory, for where an old machine is replaced with a new machine naturally the new machine and its value should take the place of the old value in the inventory, and so on.

The idea it is desired to suggest here is to get away from that tendency to gradually eliminate the value of the plant and its equipment, and to systematically set aside a machinery and maintenance fund so that at all times one is in a position to make repairs and to buy whatever new machinery is needed from funds set aside for this purpose. Then one will not be called upon suddenly to go out to raise the money necessary to buy a new machine that is required. The writer is not an expert bookkeeper and has no intention of advising or trying to set forth in any way the necessary details to follow in this work. Anyway, every business institution has its own ideas as to bookkeeping systems and details. But whatever that may be, there are two points the writer believes should be kept persistently in mind during the annual inventory season. One is to keep a value showing on the books for the plant and machinery, which is fairly representative of it as it stands, and the other is to provide systematically a fund for maintaining the machinery and equipment and purchasing new machines from time to time.

WHAT VALUE HAS CLAY?

ONE OF THE questions that might well be considered in making up the program for brickmakers' conventions is "What Value Has Clay?" To make it more specific, the question might read "What Value Per Thousand Brick Has the Average Brick Clay?"

We know that clay is one of the most wide-spread of minerals and clay suitable for making brick is found in every state in the Union and in practically every locality, except where something near pure sand soil prevails. Clay has been mined and worked for several thousand years and in some cases certain kinds of clay have established for themselves specific market values per ton.

We have in this country, for example, a business of approximately four million dollars a year done in clay. That means entirely aside from our imports of special clays. There are miners of special high-grade clays in this country who sell their products to the users, thus establishing a definite value per ton for certain clays.

The figures compiled by the United States Geological Survey show that during the year 1914 there was sold in this country, 2,209,860 short tons of clay with a total value of $3,756,568. Thus we have a general value established for clays that are mined independently and sold to clayworkers. The product listed here consists mainly of fire clay, it would seem, and clays used to make high-grade pottery.

All this, while it establishes in a way certain values for certain special clays, does not give us any clue to the average value attached to clays used for making common brick, face brick and other burned clay for building operations.

What we need, and must come to some day, is a sort of standardized value per thousand brick for the clay entering into the manufacture of these brick. That is why it is suggested that the question be given to someone who is competent to investigate the subject, with instructions to bring an answer to the N. B. M. A. meeting in Cleveland. Some day, sooner or later, the industry must have this unit of value and it is really a needful one at the present time.

We know, of course, that clay properties have values, but the values are too uncertain and indefinite, or as a rule lump sum values, which depend materially upon location and condition, and do not in any way establish a definite per thousand brick value for the raw material.

To appreciate the situation here and to understand more clearly what we should really work to in the clayworking industry, we can make comparison of clay products with timber products. The raw material for both come from the earth and primarily were abundantly distributed. In the old pioneer days timber had practically no value, that is, no definite stumpage value. The cost of lumber then, like the cost of brick today, was calculated from what it cost to get out the timber and manufacture it. By and by, however, the lumber industry progressed and as much of the timber was cut out, there grew up some apprehension of possible shortage, people got to attaching more value to stumpage and finally this value took on a definite, tangible form of so much per thousand feet, board measure. Timber values were spoken of in relation to the lumber unit of a thousand feet, just as we should have today clay values based upon the unit of a thousand brick manufactured.

So well defined and positive were the timber values made in a short while that it became practical for the man with stumpage to bank upon it. He could either borrow money from his local bank with a definite value security in his timber, or he could do as has been done of late years, issue a series of bonds on the basis of certain stumpage held and liquidate the bonds with a sinking fund of so much per thousand feet of lumber set aside as the timber was cut down and made into lumber. Indeed, out of this grew up a great timber bonding business that solved the question of financing saw mill operations.

It is to be hoped that some day soon we will arrive at something like the same system of valuation for clay properties. It will never be as simple and easy to estimate the value of a given clay property as a whole as it is to estimate the value of a tract of timber, because in the case of timber it can be seen and estimated very carefully as to turn out, while the clay property can only be sampled here and there, and all estimates carry an element of guesswork with them. This uncertainty, however, as to total quantity and character of the clay in a given property need not stand as a bar to establishing a specific value for the amount of clay used in making a thousand brick.

In other words, every brick manufacturer, like every lumber man, should, in figuring out the cost of his product, calculate that the raw material per thousand is worth so much. The actual value, of course, will depend upon the nature of the raw material, the product being made from it, and upon the location in relation to market and shipping facilities, etc. There are no more complications, however, here in clayworking than there are in timber working and it should be practically as easy to establish a standard of values per thousand brick upon clay as it has been to establish standard values of timber per thousand feet.

When we get at these values, though they will be different and it will be necessary to have quite a schedule of them, we will be getting onto the right kind of a basis for calculating cost in the manufacture of brick. This thing of counting the investment in clay property as so much capital is too uncertain. Clay values should be reduced to a working basis, preferably to that of a thousand brick manufactured, so that when a man is figuring up the cost of making a thousand brick, be they common brick or face brick, he will start in with a specified value for the raw material or clay used therein.

The first thing, however, to establish, is what specific value has clay? It is a question that may well be taken up earnestly by the brick manufacturers in their association work and aired and threshed over until a satisfactory conclusion is reached as to what should constitute a fair value for clay per thousand brick under various conditions as to the nature of brick being made, the location as to market, the facilities for transportation, etc. Once we have that, we will have the brick business on a better footing all around. Moreover, it is not meet that the industry producing the greatest building material on earth should be unable to attach a specific value per thousand brick to the raw material from which this product is made.

The biggest single item in our export trade in burned clay products for the fiscal year ending last June was fire brick, with a total for the year of $652,131. Tile other than drain totalled $499,611, building brick $369,869, earthen and stoneware $294,014, chinaware $97,089, other items $851,724, making a total of $2,764,438, or about 60 per cent of a normal year's export trade.

THE PAVING BRICK INTERESTS OF CLEVELAND, OHIO.

There is no other city in the United States of equal rank with Cleveland, Ohio, in its paving brick interests. It is the center of the paving brick industry, the headquarters of the National Paving Brick Manufacturers' Association, and in that vicinity, are five paving brick plants, furnishing millions of high-grade pavers annually. Many of the finest paving brick plants of the world are located in Ohio. In Cleveland and Cuyahoga County there are hundreds of miles of ideal brick paved streets or country highways which have made ease of travel and quick transportation possible. The Commissioners have been highly praised by a thoroughly satisfied public for their excellent work in the construction of substantial brick paved highways.

THE N. P. B. M. A., ITS AIMS AND ACCOMPLISHMENTS.

CLEVELAND IS HONORED by being the headquarters of the National Paving Brick Manufacturers' Association (Brotherhood of Locomotive Engineers Building). This organization is of greatest importance, not only to the paving brick industry but also to the propagation of the right construction of brick pavements and country highways. This association consists of manufacturers of paving brick who have specialized in this business for many years. They know their product, know its adaptability, its strength and its use. Their careful study of the problem of right construction, their honesty in their convictions and untiring efforts in promulgating right methods, makes this body of great importance to the consumers, for the simple reason that their years of business life have been devoted to placing their product and the resultant pavements and roadways on the highest plane possible.

This organization was formed in embryo at the Birmingham convention of the National Brick Manufacturers' Association, February, 1905, and placed on a permanent foundation the following April at a meeting in Cincinnati. From that time to this the organization grew in strength, until today it is one of the most important associations in the clay industry. From the beginning the financial backing was furnished by an assessment on each thousand brick manufactured. At first there was jealousy between the smaller and larger contributors, but as years passed each member began to realize that there was no cause for jealousy and that the benefits of the organization responded in benefit equally to each thousand brick produced whether by the large producing unit or the small one.

One of the staunch backers of the organization from the beginning was Mr. J. G. Barbour, of the Metropolitan Paving Brick Company, member of the executive board. His company was really the backbone of the N. P. B. M. A. in those early days and is still of immense strength to the organization. This concern is the largest producer of paving brick in Ohio and on account of its large production is the largest contributor. Other large contributors are the Medal Paving Brick Company, the Bessemer Limestone Company, the Barr Clay Company, the Alton Brick Company, the Clinton Paving Brick Company, and the Nelsonville Brick Company. The organization's membership comprises forty-six firms, many of which operate more than one plant. Twenty-five members belong to the board of directors which meets four times annually, while an executive board of four members, including the president, meets monthly. The latter body is the advisory and administrative authority of the organization.

Mr. C. C. Blair, of the Bessemer Limestone Company, Youngstown, Ohio, is the president; Mr. J. W. Robb, Clinton Paving Brick Company, Clinton, Ind., vice president; Mr. Will P. Blair, Cleveland, Ohio, secretary; Mr. C. C. Barr, of the Barr Clay Company, Streator, Ill., treasurer, and Mr. H. H. Macdonald, Cleveland, Ohio, assistant secretary.

The real purposes of the organization are given briefly in the following four paragraphs:

First. The dissemination among its membership of technical knowledge relating to the manufacture of their product.

Second. To bring to the attention of the public the merits of vitrified brick as a paving material.

Third. To influence to the greatest possible extent the proper construction of brick streets.

Fourth. For furnishing truthful and reliable information regarding other paving material, and their comparative value as pavements when considered with brick pavements.

That the association has accomplished and is accomplishing these purposes is putting it mildly. It has been surprisingly successful in these matters. Every member of the organization is manufacturing a high grade product kept up to the high standard set forth in their exacting specifications drawn in such a fashion as to make paving brick the most acceptable product possible because of its merit and reliability.

The exacting requirements, the fact that every brick sold must meet definite tests, and the pavement constructed must be laid according to definite rules are really the life and soul of the progress of the paving brick industry.

The second, third and fourth purposes are accomplished mostly through the work of the general office and the executive members, although the individuals are constantly lending all assistance possible in these particulars.

Up to the organization of the association, vitrified brick paving construction received no general directing force or attention. A single company was powerless to impose upon, or even advise the contractor, official or the public any particular or restrictive views as to how brick pavements should be built. As a consequence, for many years brick pavements were constructed in all sorts of ways, according to the whim of the contractor, who often followed crude methods, uninfluenced by experience. The result was a dissatisfied public. Brick pavements were going in not only regardless of their best possibilities, but with great carelessness, and generally with a stupid design and specification to misguide the unskilled workman.

Under such conditions the flood tide of the paving brick business was being dammed up—it could go no further unless hindrances were removed, and unless rehabilitated in the public favor. Under these conditions the industry must recede, if not cease altogether.

These cold facts with forceful men backing the cause gave birth to the N. P. B. M. A. The bringing of their product to

Graphic Story
of the
Daily Routine
in the office of the
National Paving Brick Mfrs.' Association

Secretary Blair In His Private Office.

Discussing Problems with Visiting Engineers.

Stenographers at Their Daily Grind.

A Morning Conference to Insure Efficient TeamWork.

Accounting Department.

What Shall the Answer Be

Assistant Secretary H. H. Macdonald.

Mailing "Dependable Highways."

Considering a Knotty Problem.

a high standard, the forming of specifications which command the respect and are acceptable to the most prominent engineers in this country, the securing of the indorsement with instruction concerning same in the majority of the leading colleges, the examples of proper construction shown to leading contractors and the teaching of the general public are mile-stones in the progress of this organization. The work has spread through the ten years in the life of the association and while much has been accomplished, the work must be carried on with the same activities as at present for years to come.

The campaign of education, so absolutely necessary in the face of an era of false doctrines and heresies taught by so many paving fanatics, in utter disregard of truth, has been conducted by representatives in the field in connection and co-operation with the general office, which is the headquarters of the association.

An Example of a Day's Routine.

From the headquarters goes out a daily mail of from 400 to 500 pieces, responding to every conceivable call, embodying every phase of street improvement questions possible:

University Circle, Cleveland, Ohio; Paved With Brick.

A letter from a property owner asking a single question.

An engineer wishing to know the association's reason for this or that specific direction.

Another asking for full and complete information, in order that he may revise his specifications.

Another property owner who wishes to conduct a campaign in favor of brick street improvement, and wishes all the association's literature.

A city requesting the expert service of a representative of the association, that they may be started right in their work.

A request for an inspector.

An engineer calling to discuss features of his work, or a request that some one be sent to him.

A delegation of property owners calling to discuss their wants.

A request for a conference.

A talk or lecture before this body or that.

An article for this magazine or that paper.

A request to furnish 500 voters with the association's literature, that they may be induced to vote in favor of issuing improvement bonds.

The above is a mere sample of an everyday experience, all emphasizing a growing confidence on the part of the public in the association, which has been developed out of a determination of the association to stand for honesty, integrity and intelligence, regardless of any momentary advantage, such as is often sought for by sales agents to the sacrifice of his ultimate interest. This work of establishing in public favor and extending the use of vitrified brick by securing to the taxpayers satisfactory and durable streets, is being gradually accomplished.

EXPERIMENTAL BRICK ROAD.

JUST NORTH of Wallingford, Conn., is a mile or so of experimental brick road. At least it has that appearance. It is perhaps twenty feet wide with a suitable crown, laid on a concrete base, with an inch sand cushion and thoroughly bound with cement. The engineer who built it is unknown, but whoever he is his work was well done.

So far as the brick are concerned the work couldn't have been better done, but the real value of the brick is somewhat called in question by the fact that two strips of cement, or some other composition, have been laid on the brick where the wheels run. The reason, of course, does not show on the surface, but it seems to look at it like a confession that brick is inadequate to fulfill all the requirements of a road of this character, when, as a matter of fact, as repeated demonstrations have proved, any addition is more of a detriment than a help.

A Sample of Cleveland's Brick Paved Streets, E. 76th Street.

Connecticut has been talking brick roads for a number of years. It is nearly three years ago that the Hotel Men's Association petitioned the road department for improvement and suggested the use of brick. It may be that only a few had any convictions on the subject, but even so they did not oppose the use of brick, and permitted its advocates to develop as much interest in brick as they chose. It took a long time to develop an interest, but this experimental road was one of the results, and others are in use elsewhere in the state.

Up to the time these experiments began the state of Connecticut was lagging in the road improvement movement. Since then the situation has changed and warm advocates of good roads are found everywhere and the mileage of better highways is gradually extending over the state.

Brick seems to be a favorite material and those who want brick roads are steadily increasing in numbers.

It may be pointed out, as a matter of interest connected with good roads, that Col. Albert Pope, for years president of the Pope Manufacturing Company, of Hartford, manufacturers of the famous Columbia bicycle, was one of the original advocates of good roads. The bicycle was one of the most potent influences at the beginning and the automobile is but the lineal successor of the bicycle in this important movement. It would appear that Connecticut is again coming into its own so far as good roads are concerned.

THE PAVING BRICK PLANTS IN CLEVELAND.

The Plant of the Medal Paving Brick Company.

EVERY wide awake brickmaker in the land knows Charles J. Deckman, First Vice President of the N. B. M. A., and twice president of the N. P. B. M. A. His sunny disposition has enlivened many a convention session and his earnest efforts in behalf of the clay industry in general are well recognized. If the splendid custom of electing the vice presidents in turn to the highest office of that organization is conformed to this year he will be elected to the presidency and well he deserves the honor. It is very fitting, therefore, that the convention is to be held in Cleveland, his home town and the business headquarters of the Medal Paving Brick Company. Mr. Duty, the president of the company, has made quite a name for himself in the brick industries and deserves much credit for the part he has played in turning the attention of the public to the real value of vitrified pavements. Mr. Duty was the first secretary of the N. P. B. M. A. and held that office for several years.

The Medal Paving Brick Co. owns and operates four fine plants, one at Carrollton, Ohio, a second at Malvern, Ohio, the third at Collinwood, a suburb of Cleveland, and the fourth at Wooster, Ohio, formerly owned by the Wooster Shale Brick Co. and lately consolidated with the Deckman-Duty interests under the new name.

Hough Avenue, Cleveland, a Twenty-Year-Old Brick Street.

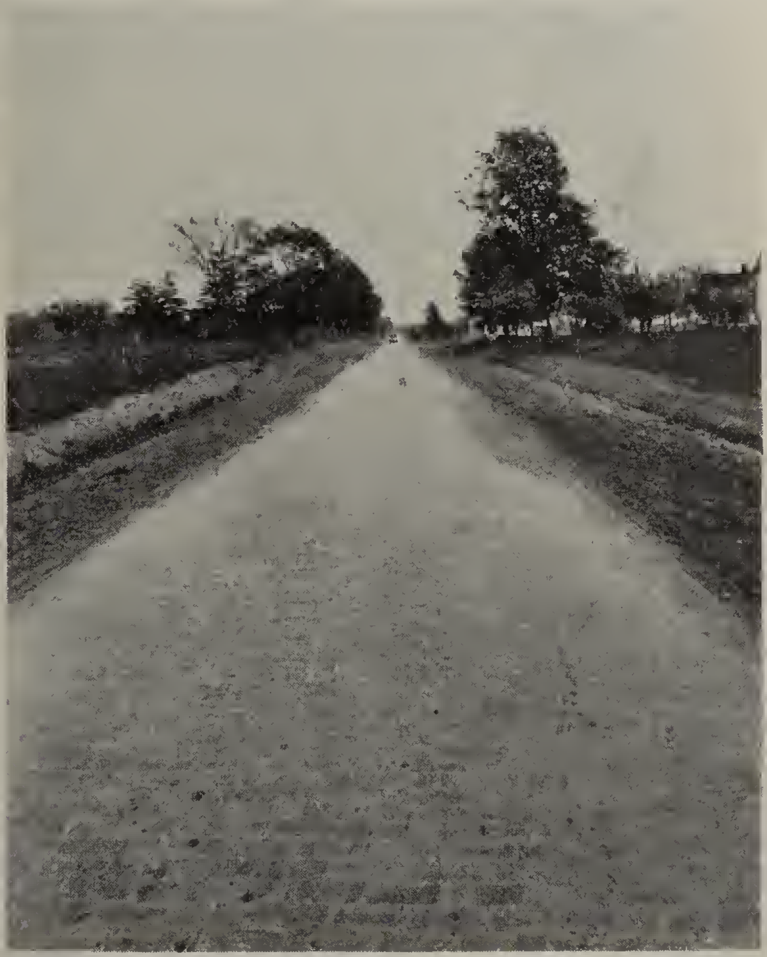
This company ranks high among the manufacturers of paving brick in Ohio; the plants are ideal and turn out a splendid product.

The Malvern plant was erected in 1887 by the Malvern Clay Company. It was the first plant to make paving brick west of the Ohio river. It was rebuilt in 1894 and destroyed by fire in 1898 but was rebuilt and in operation fifty-eight days after the disaster. Mr. Deckman was actively connected with the Malvern Clay Company from the beginning.

Mr. Daniel Duty, who had been in the common brick business for a great many years, purchased the Collinwood plant in 1897 and began operating it in 1900. Upon his death in 1902 the plant became the property of his son, Spencer M. Duty.

In 1906 Mr. Deckman and Mr. Duty purchased the Carrollton plant which had been manufacturing paving brick since 1892. The plant was operated under the firm name The Deckman-Duty Brick Company. It was this relationship that caused these gentlemen to combine their interests in 1908 and to have all three plants under the same management. This consolidation proved a wise one and has resulted in all three plants being greatly improved in the process of manufacture and in economy of operation. The combined strength of the company put these paving brick plants in the front rank and their products were much in demand. The brick were shipped to New York, into Canada. to Wisconsin, to Maryland and Virginia and throughout the Central States. Their "medal block" has attained a wide reputation. The total output of the three plants now is over 35,000,000 annually. They have furnished millions of brick for Cleveland alone and have to their credit many of the principal streets both residential and main business arteries of Norwalk, Cuyahoga Falls, Akron, Orrville, Mansfield and Sidney, Ohio; Detroit, Jackson and Three Rivers, Michigan; Union City, Winchester, Portland, Elwood and Muncie, Indiana; Dutton, Sarina, St. Thomas and Montreal, Can. Many of the important main traveled highways in Ohio and New York are paved with the Deckman-Duty "medal block." The brick for the first grouted brick pavement laid in Cleveland in 1885 were made on the Malvern plant.

When the Dunn Wire-Cut-Lug brick were put upon the market the Deckman-Duty Brick Company was one of the first to recognize its great merits and became one of the first licensees in Ohio. They manufacture a large quantity of these wire-cut-lug brick annually.



The Solon and Amora Road. One of Cuyahoga County's Brick Paved Highways.

The addition of the Wooster plant, together with the strength and force of W. R. Barnhart, Jr., formerly president of the Wooster Shale Brick Company, gives the company greater business stability and an immense output of high-grade paving brick.

The Medal Paving Brick Company but recently put on the market a special five-inch curb block which is meeting with much favor. This block is made 15 inches long, 5 inches wide and 8½ inches high. It is made with wire-cut-lugs on the ends and two ½x½-inch grooves along one side, each 2½ inches from the edge.

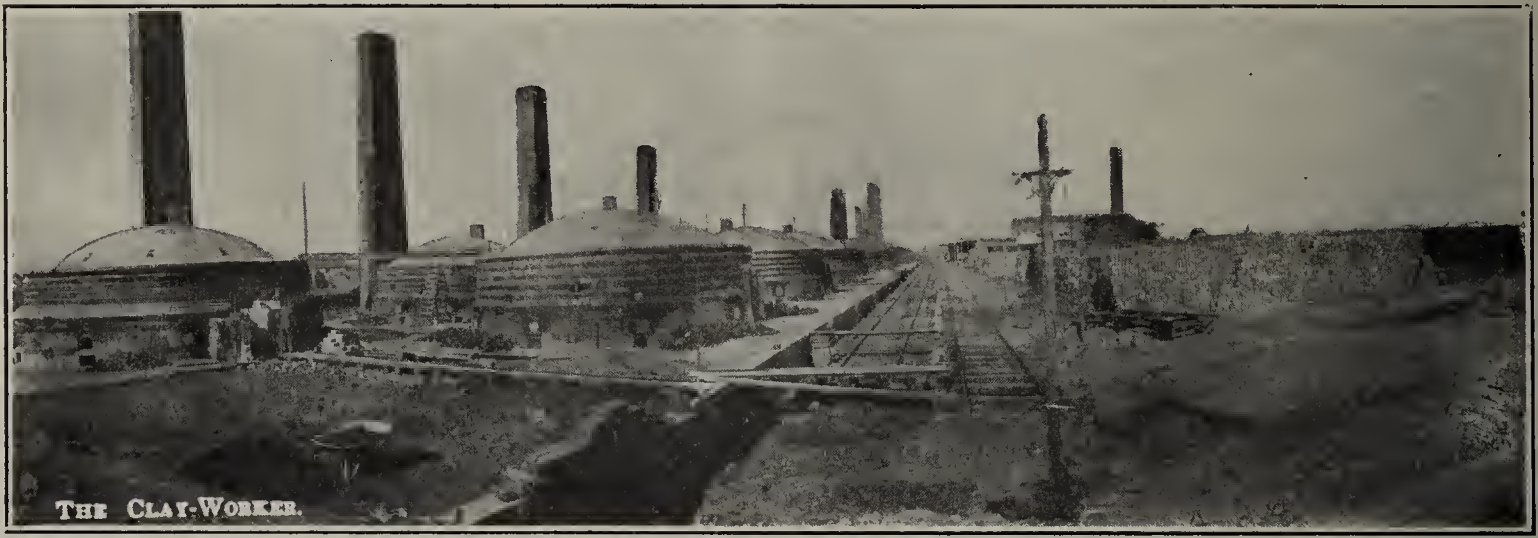
We recently accepted an invitation from the company to visit the Collinwood plant. A three-quarters of an hour auto ride through a beautiful park system over the Rockefeller Boulevard to and over a fine stretch of brick paved country roadway brought us finally to the splendid factory, eight miles northeast of the square.

This plant is so clean and orderly and operated so smoothly, seemingly without fuss or feathers, that prosperity is spelled with a large P, no matter where you look.

The shale pit is directly at the rear of the plant, a mighty deep hole, somewhat over seventy-five feet to its bottom and taking in quite a space in the landscape.

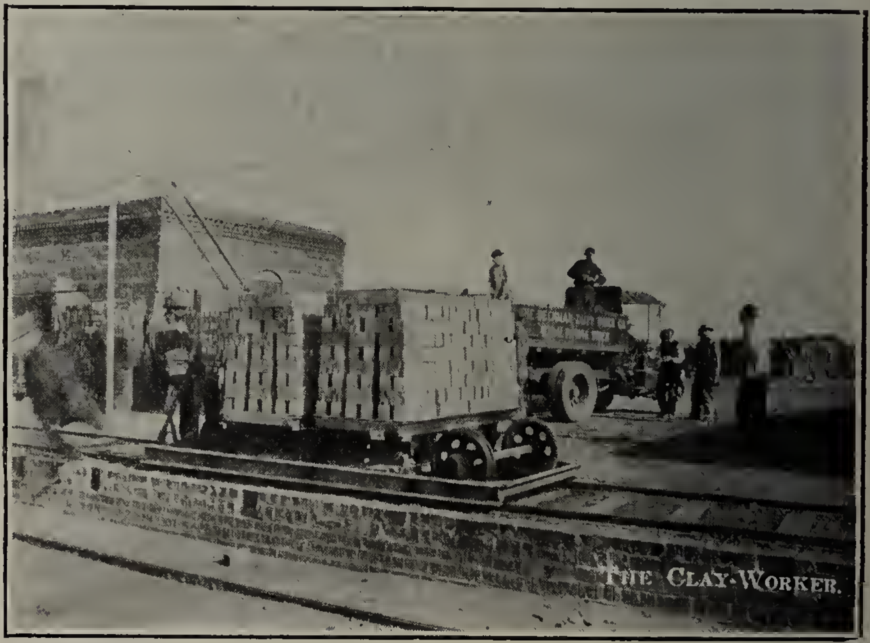
There is a three-foot layer of surface clay and 72 feet face of shale which they are at present working; 12 feet more of this shale below will be used shortly. It has been estimated that there is from 700 to 800 feet of blue shale below the present workings. The bank is blasted, the bank being drilled from top the full 75 feet. The drill hole, 4½ inches wide, is made by means of a cyclone drill of the Cyclone Drill Company, Orrville, Ohio.

The loaded cars, holding 4 yards each, are drawn up a steep incline by winding drum and cable. Forty cars are used daily.



View of Medal Paving Brick Company's Plant C, Showing Kiln Yard and Depressed Tracks.

Shale Pit to Rear of Plant C.



The Electric Transfer, with Two Cars of Dry Brick.

The raw material is dumped into a storage bin and fed into two American and one Bonnot dry pan by means of automatic conveyors in the bottom of the bin. Dodge Manufacturing Company's elevators elevate the ground material to two Bonnot piano wire screens. A Ceramic Supply and Construction Company's automatic feeder feeds the screened clay from a bin into a Bonnot pug mill. The pugged material drops into a Freese combined brick machine. The Freese automatic cutter for making the Dunn wire-cut-lug brick is employed. The run is almost entirely on 5-inch wire-cut-lug brick, 35,000 being made daily. A few repressed block are made, one Bonnot and one Richardson repress doing the repressing. Lakewood Enginering Company's dryer cars are used.

The green ware is dried in a 14-track waste heat dryer of the company's own design. An Atlas electric transfer car is used to splendid advantage, this transfer car is of two-car capacity.

The ware is burned in eighteen round down draft kilns, seventeen of which are 26 feet, the other 30 feet. The brick are burned in 11½ days, coal being used as the fuel.

The Price pyrometer system records ten kilns at a time, being connected to all kilns. The company is loud in their praises of this recording system.

Depressed tracks on either side of the kiln yard facilitates the loading of the cars.

The power of the plant is furnished by a 250-h.p. Wright engine and two boilers, one 125-h.p., the other 80-h.p.

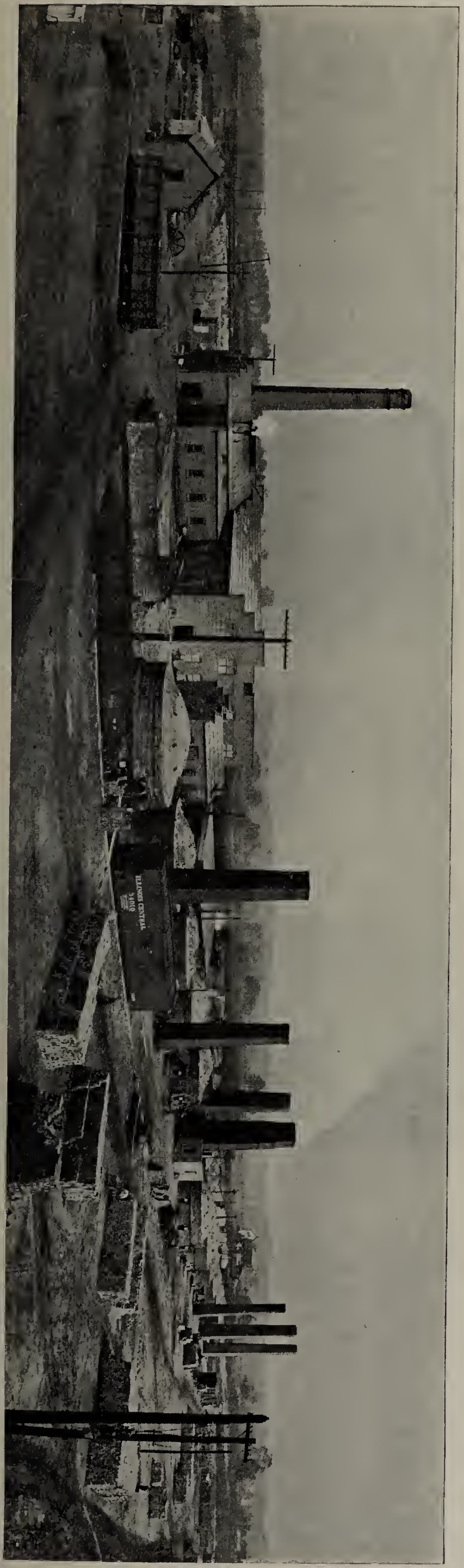
A small engine is used in connection with a generator for generating electricity for lighting and transfering.

A large brick retaining wall holds the coal shoveled from the gondola cars.

Cleveland Brick and Clay Company.

This company was incorporated in 1902, the present officers being president and treasurer, J. L. Higley; secretary, A. L. Hendershot, and vice president and general manager, W. M. Nichols. The superintendent is C. V. Hendershot. The plant is located four and one-half miles southeast of the square. Paving brick is the chief product manufactured, a small quantity only of builders being produced.

There is an unlimited amount of shale on their property. The raw material is obtained from a 100-foot bank. There is no stripping. The shale is blasted and loaded into Lakewood Engineering Company's clay cars by hand. The cars are pulled up an incline to the factory 100 feet distant by winding drum and cable. The raw material is dumped in a storage shed where it is shoveled as needed into conveying belts which serve as feeders for the three Bonnot dry pans.



GENERAL VIEW OF PLANT C OF THE MEDAL PAVING BRICK COMPANY, CLEVELAND.

The ground shale is elevated to Bonnot screens from which it drops by gravity onto a conveyor which carries it to the top of the building, where it falls into a Bonnot feeder in close connection with a Bonnot pug mill. A Bonnot brick machine, cutting table and represses are also used. The plant produces 35,000 block or 60,000 standard brick daily.

Lakewood drier cars are used, the ware is dried in an 18-track waste heat dryer in 30 to 36 hours.

The blocks and brick are burned in sixteen round down draft 30-foot kilns. Twelve to fourteen days are required to complete the burn; coal is used as the fuel.

Depressed railroad tracks run through the kiln yard, affording excellent loading facilities. The water supply is secured from the city. Gas is used for firing the boiler.

The Newburgh Brick and Clay Company.

This plant has some unusual features chief of which is the installation of the Beighlee pyrometer system, a most economical and beneficial item to the company. This system is satisfactory in its operation tabulating the results of all the kilns giving an absolute check on the work being done on this individual kiln. The company declares it would not be without this system, this night and day watchman, that never fails to do its duty.

The plant was erected in 1905 and was burned out twice. The present factory is steel construction throughout and is known as the least combustible plant of any of those in Cleveland.

The raw material is obtained from a bank to the rear of the plant. There is no stripping; there is a 100-foot tract, ten to twelve feet of it being clay with some sand and a very little cobble stone while the balance is a high-grade shale. They blast and load the (Atlas) cars by hand. The loaded cars go by gravity to the plant and return part way by gravity the rest of the way by mule. One hundred cars of shale and clay are used daily.

The storage shed is equipped with Sawyer Belting Company conveyor belts for conveying the material as needed to the dry pans. Two Bonnot Company dry pans are used—C. O. Bartlett and Snow Company elevating machinery is employed. The screened material drops from the Ceramic Supply and Construction Company screens into a storage bin from whence it is delivered as needed into a ten-foot E. M. Freese Company pug mill. The pugged clay then passed into an immense Freese brick machine. The Freese cutter and Richardson represses are used. The dryer cars are of the Lakewood Engineering Company's make.

The paving brick are dried in a fourteen track waste heat drier of the company's own design. Fans driven by electricity furnish the needed circulation of air.

There are thirteen thirty-foot round down draft kilns, coal used for the fuel. The power plant consists of a 250 horsepower Corliss Monarch engine and two boilers.

Electricity for lighting and the power for the fans is purchased from the city.

The water supply is obtained from springs and deep wells.

The product of the plant is sold in Cuyahoga county entirely. The seconds are sold to the chemical companies.

An oil well is on this company's property; however, the production is not sufficient for its use in the burning.

The officers of the company are Phillip Raimer, president and general manager; H. M. Triebing, vice president; J. F Zmunt, secretary-treasurer and A. Basel, superintendent.

A short drive from this plant takes us to that of the

The Metropolitan Paving Brick Company.

This company, one of the largest producers of paving brick in the world, has a plant in Cleveland, O., at Willow Station on the B. & O. railroad, eight miles from the public square.

This plant was erected in 1895 but has been under the present management since 1902. The factory is operated the year through producing twenty million high grade pavers.

The raw material is secured from a 180-acre tract of ground which contains a rich shale deposit eighty feet in depth.

The shale, which is handled from bank to plant by means of a hoist and a small locomotive, is ground in dry pans, screened and worked through a Bonnot stiff mud machine.

The pavers are dried in a waste heat dryer and burned in eleven down-draft periodical square kilns, each ninety feet long. The finished product is taken in wheelbarrows from the kilns to the cars and wagons. The paving blocks are 5x3½x8½ and 4x3½x8½, the brick are 2½x4x8½.

Mr. H. S. Renkert is the general manager, O. W. Renkert is the general superintendent and Mr. E. C. Carr is the plant superintendent.

Shale Bank of Metropolitan Paving Brick Company.

Cars of Shale on Trestle Near Storage Bin.

In addition to the above named concerns, the paving brick plant of John Kline at Wickliffe, Ohio, is considered a Cleveland plant, being an important factor in the paving brick business of that section.

Leadless Glaze for Ceramic Products.—In making leadless glazes it is necessary to make use of a fritted glaze. The following frit must be melted first and then pulverized with the addition of the other glaze material. The frit is composed of 42 parts kaolin, 264 boracic acid, 299 parts of soda ash, 224 parts of feldspar, 109 parts of whiting and 82 parts of flint. The glaze is made up of 730 parts of the fine ground frit, 88 parts of feldspar and 182 parts of kaolin. If it is found after some experimenting that the glaze is too hard, then the contents of boracic acid should be increased and the flint part reduced, and if the glaze is too soft then the reverse should be acted upon.—Keramische Rundschau, No. 31, 1915.

THE BURNING OF FACE BRICK IN DOWN-DRAFT KILNS

By D. H. Applegate, Jr., Red Bank, N. J.

(Continued from the January Issue.)

FUEL OIL.

Fuel oil for ceramic firing has been in use for more than twenty years past, but its users have not been sufficiently numerous to have created a general interest in it. Information regarding it is, therefore, scarce and not altogether reliable, hence every clayworker installing it must do somewhat of experimenting (which is apt to be expensive) to determine how best to burn it. All local conditions and the peculiarities of ware, kilns and burning at a given plant should be taken into account in deciding upon a type of installation.

General View of the Metropolitan Paving Brick Company's Cleveland Plant.

Kiln Yard of Metropolitan Paving Brick Company.

After much experimenting and many failures on the part of various investigators, the method of burning fuel oil which has come to be accepted as standard, is to render it as nearly as possible into the form of a gas before igniting. To accomplish this either air or steam under pressure is used to assist in spraying the oil. There has been much said in favor of each of these methods, but so far as ceramic firing is concerned their relative values have not been fully determined. Nearly all of the data available on oil burning are based on boiler tests in which the conditions are very dissimilar to those in rick kilns. In boiler furnaces the draft usually shows from ie-eighth to three-eighths inches on a water column draft auge, while in kiln furnaces for the best results it should be early balanced, drawing in only enough during the latter age of the burn to prevent blowing out at the furnace mouth. his fact, so far as the writer has been able to observe, has ot been accorded sufficient importance by investigators of is subject. All classes of furnaces have been accepted as perating under similar or comparable conditions which they ssuredly do not. In order that there may be constantly suplied to the furnace sufficient air for the needs of combustion, ther induced or forced draft must be employed. The main ifference between boiler firing and down-draft kiln firing is at the former employs induced draft to supply most of the r used, while the latter must depend almost entirely upon rced draft. The most used type of draft producer for this ork is the injector or jet type of blower, which is self-conined in the burner, using either air or steam. When comressed air is used as the jet or blast it, of course, enters into mbustion and serves the double purpose of being motive rce and fuel. When properly superheated, as it should be r this work, it not only serves as a blower to supply air to e fire, but it heats the oil in the burner to a point where dis-llation either begins or is easily induced, and as the two nerge together the steam emulsifies the oil and to a slight xtent combines with it, changing some of the heavier hydro-arbons into more volatile forms. For this reason, super-eated steam is a better vaporizer for oil than is compressed r. We have already shown, however, that the function of e oil burner is twofold, being not only a vaporizer for the l, but an air blower as well. Therefore, when a burner is epended upon to inject into the furnace a high percentage of the air needed for combustion, the beneficent effect of these the oil is more than offset by the low efficiency of the steam t blower. Steam at high temperatures is dissociated into its ements, hydrogen and oxygen. This action is accomplished y an absorption of heat beyond that required to raise the eam to the temperature of dissociation. While these ele-ents may recombine later with an evolution of heat, there is rtain to be a loss, and if, as may happen, recombustion does ot take place until the stack or open air is reached, then all e heat absorbed by the steam is lost. Hence, we may look pon steam, as upon the nitrogen of the air, as an inert gas hich must be heated to furnace temperature and which can t only as a medium for the transmission of heat from the rnace to the ware. We must assume, however, that the ordi-ary products of combustion would be sufficient to do this ere the steam not present, hence no great advantage can be aimed for it on this point. If the amount of steam used be rge it will absorb sufficient heat from the fire to reduce the rnace temperature very greatly and consequently largely in-ease the amount of fuel required. The writer has found that ith a very low draft the temperature of the furnace may in is way be reduced below that required in the kiln, while the aximum capacity of the burner is being utilized. Thus it ill be seen that the consideration of draft is very important determining the system of oil burning to be employed. An-ther major consideration is that of cost of installation and operation. The use of compressed air necessitates ex-ensive air compressors and adds greatly to the cost of the uipment as well as to the possibility of breakdowns. A eam equipment is very simple and not likely to develop se-ous disorders. Superheating coils designed to feed two or ur adjacent burners are placed in small auxiliary furnaces hich may be fired with oil or any other convenient fuel. hese, together with the piping and valves, are all that is quired.

In order to take advantage of the simplicity and efficiency steam spraying and at the same time overcome the difficulty introducing air into the furnaces, the writer has brought to use a dual system in which the spraying is done by steam and the bulk of the required air delivered by a steel plate fan blower. This auxiliary air supply is admitted to the furnace through a slot in the furnace bed near the mouth and lying in a center line drawn from front to back. A draft gauge pressure of one-eighth to one-quarter inch in the flue has been found sufficient to insure excellent combustion. The direction of the air entering the furnace is vertical, while the direction of the steam and oil jet is horizontal or slightly downwards and directly across the air slot. This insures perfect mixing, but care must be used to preserve a balance between the forces of the two currents or the flame may be directed against the bonnet, burning it out. The one disadvantage of this system is that it requires the adjustment and control of three factors instead of two. This complicates the work and makes a heavy demand upon the skill and intelligence of the fireman. Oil burning at its best, however, is not a business for the ordinary laborer, as much more skill is required than for coal burning.

By the use of this method we have been able to reduce our oil consumption about 15% and to produce better ware than by using steam alone.

In selecting a burner, from the many types available, one should be chosen in which a partial spraying of the oil is effected mechanically, as this greatly assists complete vaporization. A burner which depends upon projecting its oil against a brick for spattering is not efficient and will not produce as good results as one in which the oil is sprayed at the tip. Because of the necessity of maintaining a very low fire at the beginning of the burn, a burner should be capable of giving a flame in the open air of not more than a foot in length or six feet or more, as may be desired. This is a severe test, but it can and should be met. Any burner designed for use with high pressure air may be used with steam, or vice versa, but those designed for low pressure air (less than one pound) are not available for use with steam and are in general use not as efficient as the high pressure types for ceramic work.

Many users of oil report difficulty with burning out fire boxes, but this is probably due to improper furnace design. The furnace cross-sectional area should be just sufficient to permit the flame to pass through without impinging upon the lining, so that the gases will pass rapidly away into the kiln, and the bags or flues leading from the furnace to the kiln should be equal or slightly greater in area than the furnace, that no restriction of the fire gases may occur. In three years' use of oil at our factory we have experienced less wear upon furnace linings than a like period of coal firing would produce. We have not experienced furnace temperatures greatly in excess of those in the kiln, as have many who have used this fuel. By designing the furnaces and flues to be heat conduits rather than heat accumulators this difficulty is avoided. It must be understood, however, that the direction of the flame in the furnace must be such that it avoids harsh contact with the walls at any point. Otherwise it will burn a hole wherever it strikes. This is due not only to the intense heat applied, but to the fact that oil contains more or less alkalies which help to fuse the fire brick.

In attempting to make a comparison of the costs of the different fuels so many elements dependent on local conditions enter into the case that the determination can only be made approximately and their application to specific cases must take into account local conditions.

In attaining high temperatures with bituminous coal, the formation of hard clinker makes fire cleaning a somewhat lengthy process and a considerable loss of heat ensues. With anthracite coal the clinker is less troublesome and fires may be cleaned much faster. With oil there is no cleaning, hence no loss of heat. The labor needed for firing anthracite coal is about 25% more than for bituminous, while for oil firing the difference will depend upon the number of kilns in use. One man on each shift can attend forty or fifty burners, except in starting a kiln when extra help will be needed for a few hours. If oil contains about 19,000 B. T. U. to the pound and coal 14,000 B. T. U. to the pound, 200 gallons of oil would about equal one ton of coal, but because of the greater efficiency of oil fuel, 150 gallons in practice will do the work of a ton of coal. Anthracite coal contains about 12,000 B. T. U. to the pound, hence, as compared to bituminous, it must be used in the proportion of 14 tons—12 tons of the latter. The time of burning can be reduced by the use of forced draft as applied to any of the above fuels, hence if the use of oil or anthracite coal be compared to the natural draft burning of bituminous coal the shortened time will reduce the labor costs. If anthracite coal of the various sizes used can be bought for not more than 75% of the price of bituminous it can be economically burned, but because of its small size it burns out very rapidly and requires very close watching. If a fire burns through, the strong draft of cold air rushing into the kiln will cause a great loss of heat. For this reason, unless one has very dependable firemen, it may cost much more to use it than to use bituminous.

To go into the question of comparative costs more deeply than this and produce tables of exact figures, as many have done, is, in the writer's opinion, more apt to be confusing than helpful, as the figures will fit no case except that for which they were made. The above observations are general and can be generally applied. With them must be figured in the cost of fuels at a given point, the cost of handling the men, the cost of handling ash, the repair of furnaces and the time and cost of firing kilns by the different methods.

In conclusion let it be said that except for some specific results to be gained in certain cases, the intelligent use of bituminous coal will produce as good results and as economical as can be attained by any other fuel.

THE CERAMIST'S CORNER.

This is a new department which will appear in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give some papers read before the meeting of the American Ceramic Society at Detroit, and reprinted by permission from Volume XVII of the Transactions of the American Ceramic Society.

THE VALUE OF SPECIFIC GRAVITY OF RAW MATERIALS.

By D. E. Humphrey.

FEW CLAY MANUFACTURERS seem to appreciate the value in the use of simple specific gravity methods in determining the weight per cubic yard or cubic foot of raw material, or its use in giving a clue to the quantity of different parts of the bank.

It is often difficult to pick out the objectionable parts of a shale bank by observation. If the specific gravity of a lump from a certain strata is much greater than the specific gravity of other parts of the bank, it is a good plan to burn a few lumps of both kinds to ascertain their qualities under fire. The appearance in the bank is often quite similar. I have seen the specific gravity vary from 2.46 to 2.63 in a six foot vein of clay, with a marked difference in the firing qualities of the two extremes. It may show that a certain stratum in the bank does not possess the qualities to be desired in the pavers or whatever is being manufactured. Such information enables one to tackle more intelligently the problem of working in the objectionable part of the shale or clay supply in such a way that it will do no harm to the quality, or, if necessary, of eliminating the objectionable part entirely.

The weight of a cubic yard of bank may be closely estimated by multiplying the weight of a cubic yard of water (1684.8 pounds) by the average specific gravity of the bank. If the weight of a cubic yard of bank is known, blast holes may be located with greater assurance of securing good results. Good blasting generally brings down about four tons of shale for each pound of dynamite. Of course, this amount varies in different shale banks according to the blasting qualities of the shale. If the weight per cubic yard of the material to be blasted, the number of pounds of explosive per lineal foot of hole, and the number of tons of shale that can ordinarily be blown down with a pound of explosive are known, the location of blast holes becomes more or less a mathematical problem. Money may be saved by securing this information and occasionally making the calculation to check up the blasting in the shale pit.

The weight of a cubic yard of shale divided by the average weight of a dry brick from the dryer will give the number of brick per bank yard. This enables one to estimate the number of brick in the shale bank or in the shale storage. We have all seen companies who would probably have spent their money differently, if they had accurately estimated the number of brick in the shale or clay supply.

The weight of a cubic foot of loose quarried shale is essential in haulage calculations and storage construction. When you buy a dinky locomotive, you ought to know the per cent grade in the track, the number of cars to be hauled, the weight of the car and the weight of the load to be put on the car. For brick yard tracks, it is safe to figure 40 pounds draw bar pull for each ton to be hauled on the level, with an additional 20 pounds per ton for each one per cent of grade.

One way to estimate the weight of the loose shale is to guess at it, or ask somebody, or look it up in a hand book. A better way is to calculate the weight by specific gravity. Weigh a tub, or some similar water-tight receptable, on a platform scale. Fill the tub even full of the shale and weigh it, taking care to have the same proportion of coarse and fine shale that goes into the car or storage, and, as nearly as possible, the same number of voids. Subtract the weight of the tub from the weight of the tub and the shale, and the result will be the weight of the shale. Now empty the tub, and fill it with water. Weigh the tub full of water. Subtract the weight of the tub from the weight of the tub full of water, and the result will be the weight of the water. Divide the weight of the water by the weight of one cubic foot of water (62.4 pounds). The result will be the number of cubic feet in the tub. Now divide the weight of the tub full of shale by the number of cubic feet in the tub, and the result will be the weight per cubic foot of loose quarried shale. This method applies equally well to ground clay.

The specific gravity of a lump of clay may be easily determined with a spring balance. Suspend the lump from the scale hook and weigh it in air. Then weigh it in water. Subtract the weight of the lump in water from the weight of the lump in air, and the result will be the weight of the water displaced by the lump. Divide the weight of the water displaced by the lump by 62.4, and the result will be the fraction of a cubic foot of bank measure the lump occupies. Now divide the weight of the lump in air by the fraction of a cubic foot of bank measure which the lump occupies, and the result will be the weight per cubic foot of bank measure of the particular material in this lump. These are old methods that most of us have learned in our days of high school science.

On most brick yards, it appears that specific gravity is so old a topic, that it has been entirely forgotten. It pays sometimes to revive in our minds the old, simple fundamentals.

A card in a reference index which has on it the weight of a cubic yard of the bank; the weight per cubic yard of quarried shale, loosely packed as in the car; the weight of a cubic yard of quarried shale well packed as in the shale shed; the weight of a cubic foot of ground shale loosely packed as in the feeder bin; and the weight of a cubic foot of ground shale well packed as in the storage bin will be a comfort and satisfaction to the man who is operating a brick yard and who has improvements to make.

Another card with the specific gravity of various parts of the bank, with a note as to how each acts when burned, may be of assistance in the everlasting fight for quality.

NOTES ON THE BURNING OF SALT GLAZED SEWER PIPE

By George D. Morris.

THE OBSERVATIONS and experiments, enabling the writer to present these notes on burning and salt glazing of sewer pipe, were made on pipe manufactured from shale clay, and the principles have also been applied to pipe manufactured from fire clay.

The process for shale clay and fire-clay pipe can be divided into five distinct parts: first, water smoking; second, heating up; third, oxidation; fourth, vitrification, and fifth, glazing. These steps overlap more or less when applied to both shale clay and fire clay, although each will be treated separately.

Water Smoking. Water smoking is one of the most troublesome periods and is of much importance to the manufacturer of the larger sizes and double strength sewer pipe. The period covers the time from the start until the ware has given up all of the mechanically combined water and some of the chemically combined. In practice, this would invariably mean that the ware was bone dry or a little more. A temperature of about 350 degrees Fahrenheit would be obtained during this stage.

Successful water smoking of large size ware in a down-draft kiln should be done by using the kiln as a down-draft kiln, starting with very small fires and gradually increasing as fast as that particular clay will permit. Do not use the kiln as an up-draft, leaving the covers off for any length of time after starting the fires, unless the kiln is especially adapted, as when the kiln is covered a sudden change will result, and this we are always striving to prevent during the burning of sewer pipe. The time of water smoking varies from 24 to 96 hours, according to the size of the ware or difference in clay. A few of the effects of too rapid water smoking are as follows: scaling or blowing, blistering and cracked sockets. By scaling or blowing we refer to cases of large slabs blown off and found lying on floor of kiln. Too rapid firing causes the outside to dry faster than the inside, and the unequal shrinkage causes the part drying fastest to break loose. Blistering is very common in clays that laminate. When the mechanically combined water is driven off, it collects under the layers of clay or blister formed during the pressing of ware, and if the water smoking is too rapid, the steam or gas will collect in these pockets, causing them to swell and sometimes to break open, forming scales on the pipe. In down-draft kilns, the pipes on the bottom are subjected to greater humidity or dampness, and we find on the bottom rows of pipe the largest percentage of blisters. Cracked sockets is a common trouble when using excessive draft during water smoking. Currents of air are set up through the ware from excess draft, and the sockets dry faster than the body of pipe, causing a strain in the sockets which finally produce cracks. All of the troubles that arise in the water smoking generally occur in layers. The heat travels downward in layers, and we may have scaling or cracked sockets on the top pipe and none on the bottom, or vice versa. Too rapid firing at the beginning will cause trouble with top pipe, too slow beginning followed by too rapid firing causes the trouble to occur on the bottom pipe. Many times it is necessary to increase the stack draft, by starting fires in the stacks to warm them. Whenever the kiln bottom is very damp at the start of a burn, a built-in firebox in the stack is a very convenient arrangement for warming the flues, thus having a good draft at once.

Heating Up. Heating up covers the time from water-smoking to oxidation. In practice, it overlaps the other steps, as it is sometimes rather hard to designate without the assistance of a pyrometer. The heating up period ranges from 350 to about 800 degrees Fahrenheit. In most plants, the drying is carried on gradually; and by giving plenty of time, oxidation starts at a low temperature, therefore not much time is left. If given special attention, a period can be produced where the temperature can be raised very rapidly from 350 to 800 degrees Fahrenheit without proving injurious to pipe. The following is a schedule for burning large size pipe at one of the large shale sewer pipe plants:

Water smoking.....	0 degrees to	350 degrees in	72 hours
Heating up.........	350 degrees to	800 degrees in	24 hours
Oxidation	800 degrees to	1400 degrees in	84 hours
Vitrification	1400 degrees to	2100 degrees in	48 hours

As this period is overlapped by the preceding and following periods, we will not dwell on it, as it is not altogether practical unless used by one of more than the average fireman's knowledge of burning.

Oxidation. Oxidation is a period of great importance to successful burning of shale clay high in carbon, but is usually not of great importance to the fire clay manufacturer except for the large sizes. Incomplete oxidation is very injurious to pipe, giving them a spongy interior, distorted shapes and inferior ring. The common supposition is, that incomplete oxidation is due to improper drying; and to remedy, a day or two days are added to the water smoking period. The result from such practice is that one kiln is well oxidized; and in the next one, the same old trouble will appear again. The best, easiest and surest way, is to adopt our good friends', the brickmakers, "draw trial" system, and then with ordinary care, any one can insure perfect burns as far as the complete oxidation is concerned. Draw trial should be made of the shoulder of pipe, which is the thickest part. The draw trials are placed near the door of kiln so that on removing some of the brick from the door, the draw trials can be easily taken out. When the temperature nears 1000 degrees Fahrenheit (or just a little red at dusk), the progress of the burning out of the carbon can be noted. The trials are then drawn at regular intervals, until oxidation is complete. The temperature may be gradually increased up to about 1300 degrees Fahrenheit, and then held until trials are clear of carbon.

Vitrification. The vitrification period follows close upon oxidation, and if the oxidation is not completed before vitrification starts, there is little chance for its completion regardless of the amount of time taken for vitrification, for, when a thin layer of clay vitrifies on the surface of a body, no air can penetrate to the imprisoned carbon. As the temperature increases, the carbon burns inside of the clay body, and as it must have oxygen to complete the combustion, carbon monoxide gas is generated, the oxygen being taken from surrounding particles containing oxygen. This gas being imprisoned in the intensely hot clay ware, which has almost reached a molten stage, will cause it to swell or bloat, and then we have the spongy interior and distorted shapes. The vitrification period covers two important steps as follows: making the required temperature within reasonable time, and a uniform distribution of heat over the entire kiln. The average time for vitrification is about 36 hours, starting at about 1400 degrees Fahrenheit and going up to about 2100 degrees Fahrenheit. This time will vary considerably, due to different kinds of coal, amount of draft, size and number of fireboxes and to

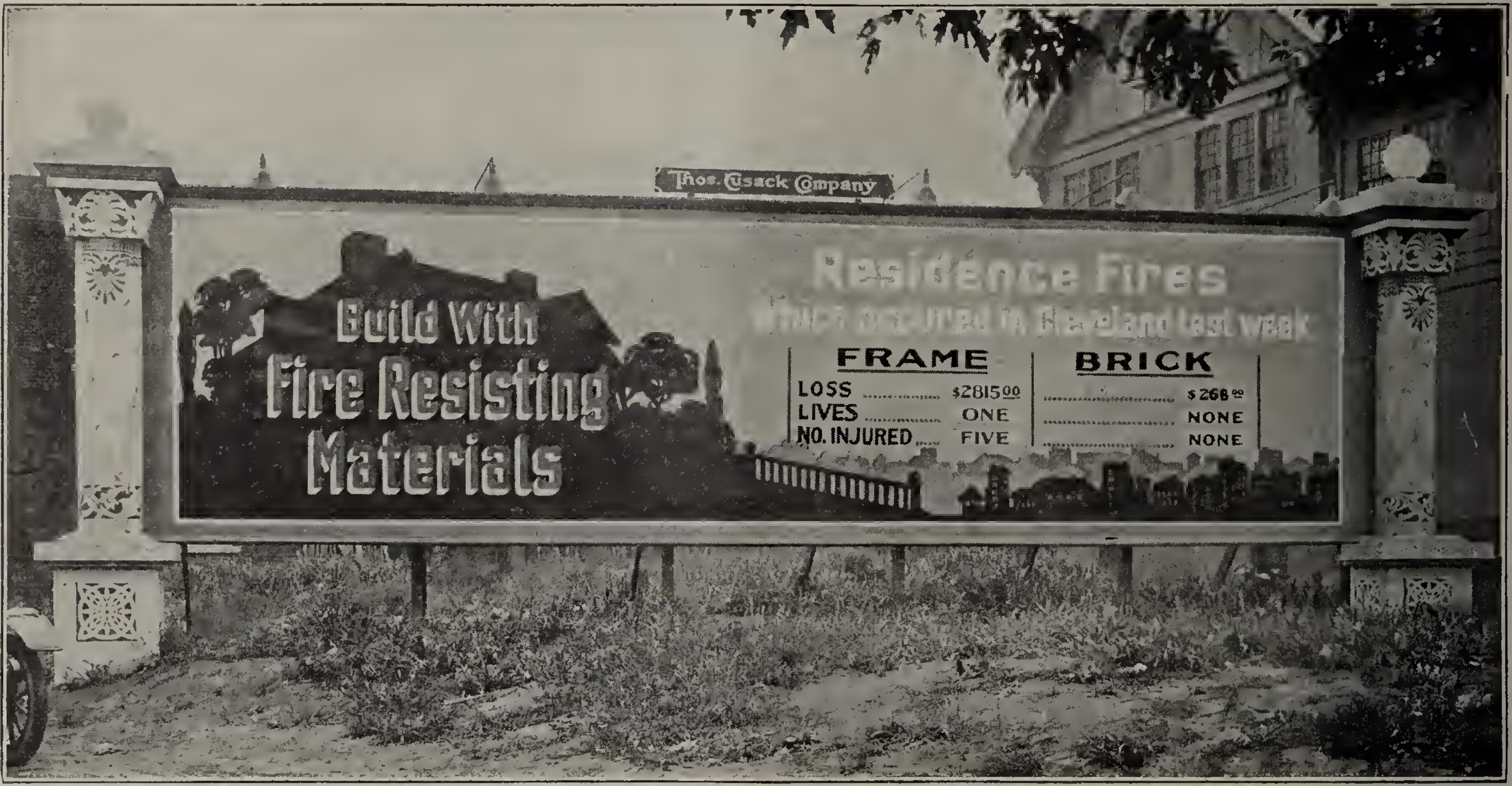
(Continued on page 206.)

INFLUENCE OF GOOD ADVERTISING.

Edgar P. Allen who writes unusual "reflections" for the Kansas City Journal recently was attracted to the advertising of the Dickey Clay Manufacturing Company, and was so interested in it that he wrote the following story, which shows the widespread benefits of well written advertising.

Irrelevant Reflections.

"Advertising is a fine art, and the more it is cultivated the more it pays. The people one meets occasionally who say in their ignorance that 'there are some things which cannot be advertised in the newspapers to advantage' are simply chronicling their own mistakes. Now the reflector is not an advertising expert and makes no pretense of knowing much about the matter from a technical standpoint, but he reads the newspapers and he is duly impressed with the kind of advertisements he sees. And he frequently is astonished at the remarkable things that come under his eyes. It is his judgment that anything that is for sale may be advertised in an attractive and profitable way. What, for instance, is the most hopeless and unpromising thing that one could imagine for artistic and convincing treatment by the advertising expert? In all the list, there seems to be nothing more devoid of interest to the general reader than sewer pipe. Think of it. Here is a subject that is both dull and practical to the point of unconventionality, and appears to possess not the remotest suggestion of general interest. By no stretch of the imagination could one conceive of sewer pipe being something to make social conversation about. In a vague fashion we all know that architects, contractors and councilmen and a few others talk about sewer pipe in a business way. And the reflector presumed that pipe is advertised in trade journals along with road scrapers, wire rope and metal lath. But had the reflector been commissioned six weeks ago to start a campaign of advertising sewer pipe as a popular article of household consumption, he would have thrown up the job—that is, six weeks ago. Today he knows that the art of advertising is equal to any task, and that the public may be made to think sewer pipe, talk sewer pipe, yearn for sewer pipe and—what is more important—buy it. It all came about through the advertising campaign carried on by the Dickey Clay Manufacturing Company in the Journal. One day the reflector looked over his paper and saw staring at him an artistic advertisement that immediately attracted his interest. The fact that it was heralding the merits of a certain brand of sewer pipe made not the least impression upon him at the time. But the advertisement went on to tell how the pipe is made from the time the clay is mixed until it is delivered as a finished product, and it was absorbingly interesting and instructive. Still, the reflector did not think much about sewer pipe. It was some days afterward when another advertisement of the same company appeared. It was different from the first and told about another phase of the industrial story that made a deep impression. The reflector was learning a lot about sewer pipe—this particular brand at least—and he was beginning to realize the importance of the subject to average person. But the campaign continued and the reflector found himself looking for more of the same advertisements. He has unwittingly developed a lively intrest in the matter. This is the real secret of the art of advertising—that is, to get the accumulative effect. The one advertisement attracted attention, but its value would have been lost had the advertiser concluded that this was all he need say about his wares. The writer of these advertisements developed his subject with great skill. He raised the discussion of sewer pipe to a high plane. He did not waste his money and his efforts in dry and



A Forceful Advertisement Used by an Association of Twelve Building Material Firms in Cleveland.

The above illustration is a bulletin displayed in Cleveland giving weekly statistics relative to residence fires which occurred in that city the preceding week, showing the comparisons between the losses in frame and brick structures. This idea originated with Mr. Zahn, Cleveland sales manager of the Thos. Cusack Company, noted for their outdoor advertising signboards, etc. This bulletin is driving home the truth about the value of building with brick, and is resulting in many specifications being changed from frame to the everlasting material. It is expected that the Cleveland Association will erect several more of these bulletins. Associations in other cities are contemplating a similar advertising campaign.

formal announcements that his company had sewer pipe to sell. That wouldn't have attracted the wandering glance of the bargain hunter. No, indeed. He placed his advertisement right in the midst of the rest of the wares which commonly appeal to men and women and he treated sewer pipe with judgment, artistry and a subtle understanding of human nature. The result was that he made his comments upon the common sewer pipe quite as fascinating as the announcements of lavaliers, silk hosiery, cut flowers, or spring hats. He wove a romantic story about sewer pipe, and in a clever way impressed the value of his own particular brand upon the public. He told why sewer pipe is important to the individual and then pointed out why his sewer pipe was better than all others. He just naturally exalted sewer pipe, to the realms of fancy and poetry. He touched this common and ugly thing with the hand of the magician and it became beautiful. If that isn't art, there is no art. The reflector does not know who writes Mr. Dickey's advertisements, but who ever he is he is deserving of high commendation. And it is the reflector's guess that Mr. Dickey is not one of those who croal about there being "certain things which cannot be advertised in newspapers to advantage." Because he did it in the right way."

OBITUARY

New York Brickmaker Passes Away.

J. H. Mead, for more than twenty-five years superintendent and general manager of the Onondaga Vitrified Brick Company of Warner, N. Y., died suddenly January 27 of heart failure. The first indication Mr. Mead's family had of any serious trouble was an attack of heart trouble just about a week before his death. The attacks grew more frequent and more severe until the end. Mr. Mead was fifty-nine years old, and is survived by his wife, two daughters and one son. He was active in church and educational affairs in the village of Warner, and his funeral was held at the village church on Sunday afternoon. Mr. Mead had been a member of the N. B. M. A. for a number of years, and had been quite regular in attendance, taking an active part in the discussions of practical questions which came before the conventions, and will be missed in future gatherings.

J. H. Mead, Warner, N. Y.

The Producer Gas System of burning brick and other clay ware, which is now attracting the attention of many of the progressive manufacturers of the land, will be expounded by the representatives of the Manufacturers Equipment Company, Dayton, Ohio, whose headquarters will be room 306 Hotel Statler, where visitors will also be advised of the merits of the Justice dryer, the Meco shale crushers, and other improved brickyard equipment.

CONVENTION POINTERS

The Brown Instrument Company, Philadelphia, Pa., will show a complete line of pyrometers and other electrical apparatus for registering and regulating heat in burning clay wares. Some interesting displays will be shown in room 339.

The American Clay Machinery Company, Bucyrus, Ohio, will have a corps of trained conventioners at the Statler Hotel, who will distribute attractive souvenirs, one of which is a beautifully colored hanger in which the words "Safety First" is conspicuously displayed.

H. Brewer & Company will be represented at the convention by Charles Burridge, G. S. Brubaker and other members of that organization, with headquarters in rooms 328 and 330. There will be no latch string for the door will be wide open to every visitor throughout the week.

The Aspha-Brick Corporation announces on page 222 of this issue that they will have suite 216 and 218 at the Statler throughout convention week, and have a proposition which is entirely new and which they think is destined to be of great value to the manufacturers of brick.

The National Dry Kiln Company, Indianapolis, has the ad de luxe of this issue as the reader may see by turning to page 225. The ad speaks for itself in no uncertain manner. A brick built brick dryer surely ought to appeal to brickmakers. Their catalogue beautifully illustrated will be sent free on request.

The Hook Patent Kiln Co., Vigo, Ohio, will be represented by W. P. Jenks, who has reserved room 325 at Hotel Statler. Brick and tile manufacturers who want to cut down the cost of their fuel bills will be shown how this can be done and at the same time secure an increased quantity and an improved quality of ware.

The Lakewood Line of clay cars, dryer cars, and all the necessary equipment required for the operation of same, will be shown in room 329 of Hotel Statler. Representatives of the Lakewood Engineering Company, Cleveland, will be on duty throughout the week, fully equipped to demonstrate that the Lakewood line is "built to last."

The Boss System of drying and burning brick will be expounded by John C. Boss and other representatives of the firm. Their headquarters will be rooms 224 and 225 Hotel Statler, and those seeking information on more economical and effective means of burning will find there a cordial welcome and a store house of practical knowledge.

L. E. Rodgers, of the L. E. Rodgers Engineering Company, Zanesville, Ohio, needs no introduction to the members of the N. B. M. A. He has been a conspicuous figure at every convention ever since he was boy in short pants. He promises to have something new and very interesting to communicate to the delegates who will call at his headquarters.

Brocade Brick will be on exhibition at the Coliseum and Mr. B. W. Ballou, secretary and general manager of the Kansas Buff Brick & Manufacturing Company, Buffville, Kansas, will attend the convention and explain in detail to all interested the method of manufacturing these famous brick. See ad on page 214 of this issue, for preliminary notice and Mr. Ballou in person for full particulars.

The Thew Steam Shovel which is in use on many of the successful brickmaking plants of the country will be shown in space 111 at the Complete Building Show and the representatives of the company will have headquarters in room 431 at the Statler Hotel convention week, where delegates looking for information in regard to up-to-date methods of handling clay will find what they are looking for.

Freese & Company, manufacturers of Dependable Machinery of Proven Efficiency, Galion, Ohio, will be on hand in full force at the Statler Hotel, with headquarters in room 443, where they expect to welcome every delegate convention week. Those looking for information in regard to automatic brick cutting tables or other brickyard equipment, see ad on page 244, will find what they want at the Freese headquarters.

The Thwing Pyrometer will be on exhibition in room 344, Hotel Statler. Mr. Thwing himself will be on the job. His portrait appears on page 208 of this issue. He needs no introduction to the general membership for he has attended previous conventions and has personally superintended the installation of many heat regulating outfits in brick and tile plants throughout the country. If you want to know anything about pyrometers, see Thwing.

(Continued on page 200.)

RECORD OF THE VARIOUS CONVENTIONS OF CLAYWORKERS.

Canadians Have a Fine Convention and Nebraska, Northwestern, Wisconsin, Iowa and Illinois Association Make Progress in Association Work.

THE FOURTEENTH annual convention of the Canadian National Clay Products Association was called to order Tuesday afternoon, January 18, at the King Edward Hotel, Toronto, by President J. Edward Frid. The attendance was larger than that of the previous year, and the delegates all united in voting it one of the best conventions ever held. After the usual opening prayer, President Frid read his annual address.

The President's Address.

In calling the fourteenth annual convention of the Canadian National Clay Products Association together in this beautiful city of Toronto, I desire first to express my thanks for the honor you conferred upon me in choosing me as your president, and I want to say this, that the position is not a very difficult one if you have an executive committee that will do the work as thoroughly as the one I had the pleasure of being associated with during the past year.

I am pleased to see such a large attendance on the opening day. We meet for the purpose of spending a few days socially and in discussing affairs of common interest in which we are all deeply concerned. The discussion on the different papers is a great advantage to every member, each one coming in contact with one another's experiences in the manufacturing and selling of clay products, and I would like to see every member present when the papers are read and discussed.

None of us ever dreamed, when attending the convention of a year ago, when our president spoke about the war, that we would still be fighting. Canada is certainly doing her share by sending 500,000 of her best men to help bring this war to a successful end. From the reports we have received from the front during the past year the boys from Canada have proved to the European powers that they are real fighters.

I have instructed the secretary to keep the following members of this association in good standing during the war: Liuet. McFarren, Lieut. Green, Lieut. Chambers. These men have enlisted to go to the front, and we know they will give a good account of themselves when the opportunity comes to them.

The first part of the year 1915 was not very encouraging to the clay industry of this country, as every one who contemplated building was afraid to start. Now, the banks have plenty of money, and I believe are giving assistance to concerns who have a fair proposition to offer. During the last few months of 1915 the building permits have increased all over Canada, so that the coming season should see all our plants in full operation.

I will not take up any of your time regarding what the different committees have done during the past year, as reports will be given by the chairmen of them.

We have an invitation from Dr. McKay to visit the new clay products and construction laboratories at the Technical School, and in a short time a course will be arranged for, so that the boys growing up will have an opportunity of receiving an education that will be a great help to them in the manufacturing of clay products.

I believe I voice the sentiments of all members of this association when I give expression of my appreciation of the valued assistance that the secretary, G. C. Keith, has rendered this association.

The entertainment committee has provided a splendid program, so that every member attending will have a good time.

It is a great honor to be president of this association, and I again thank you for this kindly consideration shown me.

The delegates were then welcomed to the city by Controller Joseph Thompson and Alderman Ramsden, while Daniel Lochrie extended a hearty clayworkers' welcome. Responses were made by Joseph Russell, of Toronto, and Hubert Desjardins, of Montreal.

The reports of the secretary and treasurer and the various committees were made, after which the following officers were elected:

Past President—C. A. Millar, president Prices, Ltd., Lumsden building, Toronto.

President—J. Edward Frid, secretary-tresaurer George Frid Brick Company, Main street, Hamilton.

First Vice-President—A. F. Greaves-Walker, manager Sun Brick Company, Traders Bank building, Toronto.

Second Vice-President—Thomas Kennedy, Dominion Sewer Pipe Company, Swansea, Ont.

Third Vice-President—William Burgess, superintendent Don Valley Brick Works, Todmorden, Ont.

J. E. Frid, Hamilton, Ont., President C. N. C. P. A.

Secretary and Treasurer—G. C. Keith, 32 Colborne street, Toronto.

Counsellors—Charles B. Lewis, Toronto; Daniel A. Lochrie, Toronto; Ryland New, Hamilton; Walter Clark, Corunna, Ont.; Albert Neal, Kingston, Ont.; Thomas Graham, Inglewood, Ont.; John S. McCannell; Milton and Hubert Desjardins, Montreal.

Hamilton was selected as the convention city for 1917.

Tuesday afternoon the delegates were taken to the new Toronto Technical School, where ceramic laboratories have been established, which are being equipped by the members of the association.

Tuesday evening all the delegates attended the theater as the guests of Daniel Lochrie.

Wednesday and Thursday were given over entirely to the reading of papers and discussion of same. Following is a list of the formal papers, some of which will be published in The Clay-Worker as opportunity may afford:

"Operating Clay and Shale Pits in Canada," by William Burgess, superintendent Don Valley Brick Works.

"Brick," by J. H. Hynes. of Hynes, Feldman & Watson, architects, Toronto.

"Application of Salt and Quicklime in Drying," by Joseph Keele, Mines Branch, Ottawa.

"Building By-Law Requirements," by W. W. Pearse, city architect, Toronto.

"Hollow Ware Dies," by A. F. Greaves-Walker, Sun Brick Company, Toronto.

"Economical Maintenance of the Power Plant," A. M. Wickens, Toronto.

"Safety in Clay Products Plants," by Inspector Charles A. Millar.

"Future of the Face Brick Industry in Canada," by Frank R. McCannell, Milton Pressed Brick Company, Milton.

"Clay Deposits in Southern Saskatchewan," by N. B. Davis, Mines Branch, Ottawa.

A. F. Greaves-Walker read Prof. H. T. Stull's paper on "Clay Preparation for Stiff Mud Products."

The Banquet.

At the banquet held on Wednesday evening patriotism was the dominating feature. Nearly all of the speakers referred to the war and Canada's participation, and those from a distance complimented Toronto on the record made in recruiting volunteers and its generosity in contributing funds for patriotic purposes. The speeches were interspersed with music of a patriotic character, both instrumental and vocal. Mr. J. S. McCannell made an admirable toastmaster, and the banquet will go down in history as one of the best our Canadian brothers have ever had.

NEBRASKA BRICK MANUFACTURERS HOLD INTERESTING CONVENTION.

THE NEBRASKA Brick and Tile Association was organized about one year ago, and the association commenced its existence with every member suspicious of the other. The by-laws provide for meetings on the second Tuesday in January, April, July and October of each year. The first and third meetings are to be held at Lincoln and the second and fourth at Hastings.

If there was any suspicion of each other remaining after the first three meetings, it was entirely eliminated by the annual meeting, January 18, 19 and 20, at Lincoln.

This was truly a love feast among brick men. Beginning Tuesday morning with an attendance of about fifteen, the final session on Thursday adjourned with thirty-seven present. Each succeeding session was more largely attended than the preceding one, and the convention was unsurpassed for interest and enthusiasm.

It will be noted from the program that, instead of the usual convention, it was a real short course in brickmaking. This splendid program was arranged by Prof. L. W. Chase, of the Agricultural Engineering Department, co-operating with Dean O. V. P. Stout and others in the College of Engineering of the University of Nebraska.

The convention was called to order at the Lindell Hotel, Lincoln, Tuesday morning, January 18, at 10.30 o'clock, by Vice-President F. G. Burnham.

Following the usual routine, Mr. A. H. Farrens, chairman of the committee on arrangements for the meeting, gave a complete outline of the plans, calling attention particularly to the cheerful willingness of the university to co-operate with them in making this meeting an instructive one.

Adjournment was taken until 1:15 p. m., and the delegates went in a body to the Mechanical Engineering building, located on the downtown campus, where the real business of the session was to commence.

"An Efficiency Study of Bricklaying" was presented by Dean O. V. P. Stout, of the College of Engineering, illustrated by some motion tables and views to bring the points out more forcibly. Dean Stout gave credit to a work published by Frank B. Gilbreth for many of his illustrations.

A number of questions followed the lecture, and the answers by Dean Stout added much to the interest.

The meeting adjourned to the Museum, where Prof. E. H. Barbour was to talk on "Clays of Nebraska."

Chancellor Avery met the visitors at this point, and his address of welcome was listened to with much interest, as it outlined clearly the attitude of the university toward the brick and tile men. He spoke of clayworking being one of the oldest industries of the world and urged interesting the people of Nebraska in the work. The chancellor said the university would gladly assist in every way it could in the development of the clay industry.

Professor Barbour, of the Geological Department, first called attention to the importance of chemistry in determining the value of different clays. He hoped that in the near future Nebraska would have a "clay school," where brick men could come for a short course. The professor has visited every clay pit in the state and has prepared maps of most of them.

Mr. Schramm showed some views of brickmaking in Guatemala. One peculiar thing was that, while the house walls are of sun-dried brick, the roofs are all made of red burnt clay tile.

Professor Borrowman very interestingly described the difference between the physical and chemical characteristics of clay, showing clearly that the physical is more important than the chemical. With charts and specimens, the laboratory testing of clay was clearly defined.

Miss Hinterlong, of the same department, followed with exhibits of pottery, glazed and unglazed, explaining the difficulties in putting on a good glaze. Attention was called to the fact that if clay is ground too fine the ware will crack.

The meeting then adjourned to the Mechanic Arts building, where, with the use of the blackboard and samples of clay products, Prof. George R. Chatburn proved the value of testing material.

In the testing laboratory, Prof. C. E. Mickey gave a splendid demonstration. The crushing strength of several different types of brick was shown, accompanied by a full description of the machine and explanation of the process.

At 8:00 o'clock p. m., in the gold room of the Lindell Hotel, the brick manufacturers and a great many farmers, who were in the city attending the meeting of Organized Agriculture, listened to a very interesting illustrated address on "Silos and Permanent Farm Buildings," by Prof. M. L. King, secretary of the Permanent Buildings Society of Iowa. That is, he came as a professor, but became so firmly entrenched in the hearts of the brick and tile men of Nebraska that when he went home he was to them just plain Mat King. It took only a short time for him to prove conclusively that he was a thorough master of the subject, and his address, illustrated by splendid views, was one of the very best presented at this meeting.

Wednesday morning was given over to an address on "Commercial and Manufacturing Costs," by Mr. F. D. Stone, of Lincoln, Neb. Mr. Stone has attained a splendid reputation because of his ability to eliminate so-called red tape from cost accounting. After a careful explanation of the principles of accounting, Mr. Stone illustrated with charts and blackboard plans for arriving at manufacturing costs. He explained to the audience the right and wrong way of arriving at the profit to be obtained, and at the close of his talk, which continued for about two hours because the audience refused to allow him to go, a motion was made and passed unanimously authorizing the appointment of a committee of three to devise some plan for a standard system of cost accounting, to be installed in the various brick plants, and make a complete report at the next meeting, to be held the second Tuesday in April, 1916.

The afternoon session was called to order in the Engineering Annex at the university farm, where Prof. L. W. Chase told in a clear, concise and convincing way how every farmer could be his own brickmason. He called attention to the large amount of advertising done by other forms of building material and suggested that the brick men had a splendid field to work in and should do more along these lines. He suggested that a great many farmers were familiar with the use of woodworking tools, and directed attention to the fact that the brickmason required fewer tools, and it should not be a difficult matter to teach a farmer how to lay up a course of brick.

Professor Chase had a number of valuable suggestions, showing ways in which the desirability of brick in the construction of farm buildings might be brought to the attention of the farmer.

Col. Z. S. Branson, of Lincoln, an auctioneer of more than state-wide reputation, led the discussion on this subject. The colonel, by the way, owns a number of farms and is just now engaged in building a number of brick buildings. He suggested that by getting the farmer used to handling the trowel it would be much easier to convince him of the value of the use of brick. The colonel stated that some time ago he arranged with a brickmason to go down to his farm to do some work, and because of some delay he and his boy went ahead and put up the building themselves, which experience proved to him that it was not a difficult task after all. The colonel's remarks were received with numerous outbursts of cheering and applause. He is a witty talker, and made a number of thrusts that went home.

Mr. O. W. Sjorgren, as assistant in the Agricultural Engineering Department, gave an illustrated lecture on "The Design of Permanent Farm Buildings." He laid great stress on the value of making complete plans for the building before beginning the erection of any buildings, so that each building could be erected with direct reference to its relation to other buildings, and he made it clear that as a rule farm buildings should be designed around a hollow square, so as to provide for the greatest efficiency. He pointed out the dangers of scattering the buildings too much.

At the close of this talk Mr. John Rippey and Prof. L. W. Chase conducted those present on a tour of inspection of the buildings on the farm campus.

At 6:30 p. m., all delegates sat down to a well-laid banquet in the gold room at the Lindell Hotel. At the conclusion of the feast "Mat" King was called on for a talk outlining the plans, purposes and accomplishments of the Permanent Buildings Society of Iowa, which he did in a way to elicit applause from those present.

Dean O. V. P. Stout, of the College of Engineering; Prof. E. H. Barbour, of the Geological Department; Prof. L. W. Chase, of the Agricultural Engineering Department, of the university, together with Mr. J. S. Nichols, of Columbus, Neb.; Mr. Harry Smith, of the Smith Brick Company, Omaha; B. Koehler ,of A. Koehler Company, Geneva; Henry Ohlsen, of Henry Ohlsen & Son, of David City; Mr. C. Klose, of the Lincoln Brick Works; Mr. A. H. Farrens, of the Western Brick and Supply Company, and a number of others were called on for short talks, all of whom congratulated the organization on the splendid program arranged, and suggested that in the future they would gladly co-operate in building other programs along the same lines.

The last day of the session opened Thursday morning at 10 o'clock, with the largest attendance of the convention. Prof. Homer F. Staley, of the Department of Ceramics of the Iowa State Agricultural College, having been unable to reach Lincoln on Tuesday morning, reported promptly Thursday morning and started the proceedings with a rousing talk on "Vitrification," after which Prof. E. W. Nicolet, landscape architect, gave an illustrated talk on the use of brick in landscape architecture. His talk both surprised and pleased his audience, because of the unthought-of possibilities and the wonderful manner in which he presented the subject.

At the opening of the afternoon session, Professor Staley was requested to devote an hour to the subject of "Glazing." He took up the elements of this work and explained just how to produce the glaze, etc., on brick or other kinds of ware. Every step in his lecture showed conclusively to those present that he was a master of the subject, and they felt highly indebted to Professor Staley for his trip to Lincoln and the splendid talk he had given them.

This concluded the educational program, and the final business was taken up with Vice-President F. G. Burnham in the chair. The following officers were unanimously elected:

President, B. Koehler, Geneva; vice-president, J. S. Nichols, Columbus; treasurer, C. Klose, Lincoln; secretary, Frank I. Ringer, Lincoln.

Executive Committee—W. H. Ferguson, Lincoln; F. G. Burnham, York; C. Klose, Lincoln; A. H. Farrens, Lincoln; J. W. Turner, Seward.

The chair appointed the following committees:

Standard System of Cost Accounting—A. H. Farrens, Lincoln; R. D. Ferguson, Lincoln; Harry Smith, Omaha.

Educational Committee—Glen Fordyce, Lincoln; Prof. L. W. Chase, Lincoln; R. W. Besley, Omaha.

Resolutions Committee—A. H. Farrens, Lincoln; Henry Ohlsen, David City; Hugo Polenske, Hastings.

It might be explained that the educational committee was appointed for the purpose of gathering material for a text book that could be at some time used in the schools. We have found a demand in some of the rural schools for samples of clay products, together with information as to the various uses of such products.

The session had been so interesting from start to finish that the appointment of a resolutions committee was overlooked, but they were instructed to prepare resolutions to be incorporated in the minutes of this meeting, as though the committee had made the report before adjournment.

EIGHTH ANNUAL CONVENTION OF NORTHWESTERN CLAY WORKERS' ASSOCIATION IN MINNEAPOLIS SHOWED GREAT ENTHUSIASM AND MUCH GOOD WORK DONE.

The Northwestern Clay Association held its eighth annual convention at the West Hotel, in Minneapolis, January 20 and 21. While this association is not large, owing to the limited number of plants within its field, yet its officers and members have the faith of their convictions and are faithful in their efforts to build up a lasting organization which shall exert great influence in behalf of brick and tile. The gathering just held was not as large in numbers, but it made up in enthusiasm and in good work accomplished. A representative gathing from the different parts of the state and some from adjoining states, was present. The usual preliminaries of registration were gone through with, after which F. B. Martin, of Minneapolis, president, delivered his annual address which was a straightforward talk on business conditions and suggestions of methods to make the most of them. He noted a higher range of prices and a greater demand for materials. He referred to the plan of co-operating with bricklayers' unions as a means of getting workmen, emphasizing that if they are met halfway, they can be worked with, to get good satisfactory workmen whose work will help in the demand for brick. He touched upon the campaign against fake advertisers, and spoke of an arrangement whereby members could receive bulletins touching clay matters, published by the state university of Illinois. He closed with a plea for greater support for the association.

The report of the secretary and treasurer L. G. Rose, of Minneapolis, showed a fair balance on hand.

A stereopticon lecture by Fred L. Schmidt, of Minneapolis, on the economical application of electricity to clay plants, was delivered. Mr. Schmidt is with the General Electric Company, and showed a number of views of clay plants which are motor driven, some having machines geared direct with pug mills or other machinery, and others having only a small amount of belting and shafting. He gave figures of comparative cost for installation and operation of steam engine and electric motors, showing a much lower operating cost for the latter than for the former. He also answered a number of questions as to costs, loss in transmission, causes for unsatisfactory operation of motors, etc. He urged that all bearings be very closely covered and guarded against the admission of sand and dirt, as that would be sure to cause trouble.

The Banquet.

The banquet was held in the evening with a good attendance. The Minneapolis Ladies' Quartette furnished music which greatly pleased the guests, and they were liberally encored.

The principal speaker of the evening was Maurice F. Flagg, of the Minnesota State Art Commission.

Mr. Flagg is a most interesting speaker, with dynamic force, whose thoughts come forth with remarkable speed and clearness. He touched upon the work of the commission in designing a model farm house which had been developed by inquiry of farmers and others, as to their needs for a model ten-room farm house, to have separate quarters and a separate entrance for the hired help, the house to cost $3,500. The commission held a competition for such a house and secured a number of designs, and, together with such information as naturally accompanies, are distributing them to the people, not only of the state but they have been widely distributed, even to foreign countries. They have distributed nearly three million plans for better houses. A second competition was arranged for a model village house, to cost $3,000, and from this the commission has sold eight thousand plans. The lumber concerns have drawn upon these plans freely to distribute to their clients. Another competitive proposition was the design of a model farm yard, and here again a great many plans have been sent out. A further application of the work of the commission has been a campaign for the right relation of pictures to the home. A model house has been built at the state fair ground, to give visitors an idea of the arrangement and layout of what is deemed a model dwelling. The fireproofing men have been after the commission to develop something along their line, and a demand is growing for a model brick and fireproof home. Along this line Mr. Flagg suggested the possibility of those interested co-operating in a plan for an education scheme to develop and establish the possibilities of using brick for construction. A campaign for model plans, to produce plans for fifty small homes to cost from $3,000 to $3,500 to build. In the lumber business they are offering some very attractive plans showing what can be done with their material. But in the brick business there appears to be nothing of the kind available. If dealers had similar information it would doubtless tend to stimulate the use of brick. The commission has no funds which it could devote to providing such plans, but if such a fund were developed and a competition arranged, he felt certain that the architects would co-operate heartily in working out desirable plans. He suggested that if every manufacturer of brick would subscribe to such a fund the value of two wagonloads of brick, the fund so raised would go a long way toward financing such a competition as would produce high grade plans which it would be a delight to offer to intending builders. He suggested plans for five-room houses which should be built of brick and cost from $1,500 to $2,000.

F. B. Martin, Minneapolis, Retiring President.

Mr. Flagg's talk speedily resulted in action and funds were pledged immediately by those present, to a fund which is to be used for such a competition, the details of which are to be worked out as soon as possible.

The Second Day.

The nominating committee reported the following for the respective offices:

President, B. Frank Pay, Fowler & Pay, Mankato, Minn.

Vice president, L. G. Rose, Minneapolis Clay Brick Manufacturing Company, Minneapolis.

Secretary-treasurer, R. H. Smith, Farmers' Clay Brick Company, Minneapolis.

Executive committee, F. B. Smith, Twin City Brick Company, Minneapolis; A. C. Ochs, A. C. Ochs Brick and Tile Company, Springfield, Minn.; M. C. Madsen, Hutchinson Brick and Tile Works, Hutchinson, Minn.; Jacob Voelker, Winona, Minn.; E. H. Cobb, Hydraulic Press Brick Company, Minneapolis.

The foregoing were unanimously elected.

The resolutions committee presented its report as follows:

Resolutions of the Eighth Annual Convention of the Northwestern Clay Association.

WHEREAS, The furtherance of the clay industry is closely related with establishing and extending fire limits, we urge upon our members to work in their respective communities to enlarge such limits, and to have such instituted where none now exists; and,

WHEREAS, Brick and tile manufacturers of the state as taxpayers, help to sustain the state university, we urge upon the board of regents of that institution that they abolish the fee now levied for testing brick and tile for manufacturers of the state, and hereafter do this work free of charge that the value of brick and clay and other mineral products may be disseminated to the residents of the state; and,

WHEREAS, All indications are that there is a prosperous year approaching for building interests, we urge upon our members that they exert every effort to push the use of brick and tile, by sending to every intending builder such information as may best present the worth of our products. Proper publicity, extended early, will develop our own business in excess of the natural increase, and this must be the method through which our product shall take its rightful place in the materials used in building; and,

WHEREAS, There is not sufficient inducement to owners to build fireproof structures because of the inequitable rates charged for insurance on these as compared with non-fireproof buildings, we urge upon insurance companies and their rate-making bureaus that their rates be revised to offer more of an inducement to build absolutely fireproof; therefore, be it

RESOLVED, That we extend our thanks to the retiring officers for their faithful work for the past year; to the speakers who have appeared before us; to James G. Houghton, building inspector of Minneapolis for the courtesies extended by his office, and to the management of the West Hotel for the many favors received during our convention; and, be it further

RESOLVED, That we urge that all means be exerted to work with the Minnesota Art Association for the development of a higher standard of art in moderate residence work and with the state fire marshal for greater safety from fire.

The report of the resolutions committee stirred up some discussion with reference to the state university making tests of brick and tile free for citizens of the state, and the clause regarding more encouragement from fire underwriters for fireproof construction, and all were finally adopted. A committee was also named to confer with the underwriters on the subject of a better rate on fireproof construction, as compared with non-fireproof.

An interesting talk on the use of coal to get the best results was given by Murray B. Grover, of the Berwind Fuel Company, Minneapolis. He gave much practical information regarding firing, urging that fires be broken up from the top with a two-pronged claw rather than from beneath with a slice bar. The latter method tends to push the impurities which lie on the grates up into the body of the fire, where they fuse and form larger bodies, to be handled again. He urged regulating the fire drafts by a damper in the pipe rather than with the ash door, but added that most dampers in pipes were so located that it required a stepladder to get at them, with the result that firemen took the easier method. He recommended scraping or blowing out boiler tubes every eight to twelve hours, favoring blowing with high pressure boilers, but with a pressure of 40 pounds or so, blowing will not do. Blown tubes should be scraped once a week to clear deposits. A deposit of one-quarter of an inch of soot or scale, calls for a great deal more heat to produce the same results. Answering a question he stated that Pocahontas coal can be used for starting burning in place of wood.

A representative of the Minneapolis Civic and Commerce Association was invited to state what would be done if the association were to endeavor to get the next gathering of the National Brick Manufacturers' Association to Minneapolis, and there was considerable discussion as to whether the trade of the Northwest could undertake the entertainment of the association. The matter was referred to the executive committee to make such moves in the matter as seemed wise, and to extend an invitation to the association if it appeared to be desirable, after the complete data had been secured.

On motion a gift of $25 was ordered paid to retiring Secretary Rose for faithful work during the past year.

The address of T. A. Randall, of The Clay-Worker, "Build With Brick," outlining the campaign which has been waged with success under that title was read to the convention, and was listened to with great attention.

WISCONSIN CLAYWORKERS MEET AT MADISON.

THE SIXTEENTH ANNUAL convention of the Wisconsin Clayworkers' Association was held in Milwaukee, January 27 and 28. The attendance was good and the program contained a number of papers of unusual interest.

President A. W. Hilker opened the convention with an address full of good cheer for the delegates. He said in part:

"We believe the period of financial depression is past and that the public will now spend more freely. The brick and tile business has been steadily on the increase. A number of plants have increased their capacities. The general outlook for the year is encouraging.

"The development in building circles has been steady and along normal lines.

"Our Wisconsin clays are limited in number and if any marked changes take place they will probably come about as a result of the investigations carried on by the geological department at Madison."

For a number of years the Wisconsin Association has had a standing committee on freight rates which has done effective work along the lines of regulating rates on clay products. In a paper entitled "Freight Rates on Brick in Wisconsin," John Ringle, of Wausau, covered the subject comprehensively, outlining the work of the committee the past year and declaring that the Wisconsin brick manufacturer had to pay a higher rate than any of the adjoining states, and urging the members to have a good representation at a meeting of the interstate commerce commission to be held in the near future when the matter was to be considered.

Thursday evening a "round table" discussion took place during which a number of talks were heard both on the rate and publicity question.

Friday morning was devoted to the regular program. One of the most interesting papers of the day was one by W. H. Schuchardt, a well known architect of Milwaukee, entitled: "The Present Styles of Brick and Brick Architecture." Mr. Schuchardt told the convention that "The actual partnership between those who plan and those who execute must be realized before any great results are accomplished."

A. W. Hilker, Racine, President.

The afternoon session was largely devoted to the report of the resolutions committee and the election of officers.

Resolutions were passed against granting an increase to the railroads on clay products in Wisconsin and urging a protest against the advance to the railroad commission.

By resolution the association urged congress to pass a bill now pending to discontinue use of the Fahrenheit scale in government publications in favor of the centrigade scale as being much simpler.

Resolutions of condolence were passed expressing sympathy to the family of J. W. Hinkley, a former president of the association, who died during the year.

All the officers were re-elected, as follows: President, A. W. Hilker, Racine; vice president, Oscar Zimbal, Sheboygan; secretary, Samuel Weidman, Madison; treasurer, Samuel Gunther, Port Washington.

At the annual meeting of the stockholders of the Alliance Clay Product Company, Alliance, Ohio, the reports of the officials showed that a very satisfactory year had just closed and that the outlook for an equally successful year was very promising. The usual 6 per cent. dividend was ordered paid the stockholders. The company contemplated installing considerable new machinery in the near future. All of the old directors were re-elected including B. F. Weybrecht, John Eyer, Robert Auld, John H. Bonner, P. D. Howell, T. A. Ballou, C. C. Schwalm, J. B. Wilcox and Otis Wilcox.

THE 35TH ANNUAL CONVENTION OF THE IOWA CLAY PRODUCTS MANUFACTURERS' ASSOCIATION OPENED AT AMES WEDNESDAY, FEB. 2.

THE OPENING MEETINGS were quite well attended notwithstanding the fact that the opening date was first advertised for February 3. The first session being a business session and because of the fact that the attendance was not large, the election of officers was deferred until the meeting of the 4th. The first day's session was given over to a discussion of trade subjects and the work being undertaken by the Permanent Buildings Society. The evening of the first day was given over to a stereopticon lecture on the problem of Draining the Everglades of Florida, delivered by Prof. Stewart of the University of Minnesota.

The fact that this week is what is called Short Course Week at the Iowa State College, and that some 2,500 are in attendance, and the further fact that Ames is practically devoid of hotel accommodation, will account for the fact that the very unusual program—one seldom equalled—did not draw out the largest attendance in the history of the association.

The college authorities certainly put forth every effort to provide accommodations. The school sessions were suspended so that the student quarters would be available, but the students had just returned from "home, sweet home" and many remained in Ames.

C. B. Platt, Van Meter, Retiring Secretary.

On the opening of the session, February 3, a temporary chairman was selected because of the unavoidable absence of B. C. Keeler, president, and William Goodwin, vice president. H. R. Straight, of Adel, was selected as temporary chairman. The convention proceeded to elect officers as follows: B. C. Keeler, of Mason City, president; H. A. Rawson, of Des Moines, vice president; Prof. Homer F. Staley, of Ames, secretary, and H. R. Straight, of Adel, treasurer. The program was then taken up and pushed along as fast as possible.

There was one feature in regard to the program which would naturally tend to curtail full discussions of the papers. It was long, considering there were but two days, and the speakers generally gave their subjects full consideration.

It seldom happens that clay conventions have so much good crowded into two days and it seldom happens that so many men of national reputation in the clay world are secured for one state convention and therefore that those who remained at home missed much. The following men were the speakers: Prof. A. V. Bleininger, John W. Anderson, Harold Copping, Dr. G. C. Mars, Prof. Chas. F. Binns, Leon C. Goodman, A. H. Roberts, H. W. Wagner, Prof. M. P. Cleghorn, Daniel E. Reagen, John C. Boss, R. W. McManigal, Math. L. King, Earnest H. Gaunt, of Babson's Statistical Organization; Dwight T. Farnham, of the Emmerson Company Efficiency Engineers; G. A. Wrightman, secretary of the Iowa State Manufacturer's Association, and Prof. Homer F. Staley. All of these gentlemen fulfilled the expectations of those who came to learn and be entertained and, of course, left behind them the good impression they have become so accustomed to leaving.

The Iowa Association might not have felt that it could of itself afford to secure such a program as was presented at this meeting and all feel that they have just cause for a feeling of pride over the fact that they live in a state which has developed such an institution as the Iowa State College.

The convention closed late on the afternon of the 4th of February. The resolutions committee took particular notice of the fact that the board of control was operating a clay products plant and proposed to erect a larger one and that they were active competitors of the regular manufacturers. The resolution bearing on this subject left no doubt as to the objection which exists on the part of the Iowa clay products manufacturers and it is probable if followed out, will exert a powerful influence, the growth of a competition which can be considered in no other light but unjust and undesirable.

Mr. M. L. King, secretary of the Permanent Building Society, an organization of Iowa clay block manufacturers, gave a lecture illustrated by lantern slides showing the extensive use of block on the farms of Iowa. This lecture is what Mr. King usually delivers before the various farmers' institutes, which he appears before during the winter months. Mr. King's lecture was given on the evening of the scond day's session.

The balance of the same evening was given over to a "mixer," open to all visitors and taking place in engineering hall. Songs, cigars, the flowing fountains of mineral waters and good fellowship contributed to an evening of enjoyment into which the lurking contemplation of the hammock cot could not break. "Clayworkers Camp" was pitched on the top floor of engineering hall annex. It was a joyous camp, Dr. S. W. Beyer, the old time friend and champion of the fraternity, never failed to see that the couch was made as downy as possible (a fact to whcih George Schnurr can attest) before he departed to spend the few remaining hours before the next day's session with the dear ones at home. After a protracted meeting presided over by Harry Vincent and Matt King and devotional exercises lead by Dan Morey, Jr., quiet generally stole over the camp, and the watchful waiting bunch kept their eyes upon the spanning wires between the wireless station towers—thinking of the messages passing through space to the world without and wondering whether they might not soon be numbered with those who go out to fight, not to uphold the honor of their country perhaps, but to hold their place in the sun—until first came oblivion and then the sentinel came—glanced in, listened and left wondering at the free conscience which engendered such efficient slumber. Verily, they all slept, and gave evidence that they did is why your scribe can tell you that they slept from early morn till dawn of day and never missed a snore.

IOWA.

Those in Attendance.

S. G. Elton, Richland, Iowa, Richland Tile Co.
R. B. Hinkley, Luverne, Minn., Luverne Brick & Tile Co.
W. B. Roberts, Chicago, Ill., H. W. Johns-Manville Co.
H. J. Melcher, Geneva, Neb., A. Koehler Co. (Brick and Tile).
Dan Morey, Jr., Ottumwa, Iowa, Morey Clay Products Co.
H. J. Votaw, Plymouth, Ohio. The J. D. Fate Co. (Machinery).
H. R. Straight, Adel, Iowa, Adel Clay Products Co.
W. H. Merkel, Bucyrus, Ohio, American Clay Machinery Co.
J. L. Raney, Fairfield, Iowa.
H. Tanner, Chicago, Ill.. Chicago Retort & Fire Brick Co.
A. H. Connelly, Mason City, Iowa, Mason City Brick & Tile Co.
E. A. Hults, Mason City. Iowa, North Iowa Brick & Tile Co.
J. L. Parsons, Fort Dodge. Iowa, Lehigh Sewer Pipe & Tile Co.
S. J. Galvin, Mason City, Iowa, American Brick & Tile Co.

W. E. Millinton, Mason City, Iowa, Mason City Brick & Tile Co.
Amos P. Potts, Mason City, Iowa, Mason City Brick & Tile Co.
S. E. Cogswell, Des Moines, Iowa, Iowa Pipe & Tile Co.
T. W. Straight, Auburn, Iowa, Auburn Brick & Tile Co.
H. S. Vincent, Fort Dodge, Iowa, Vincent Clay Products Co.
M. L. King, Des Moines, Iowa, Permanent Buildings Society.
F. F. Carhart, Sheffield, Iowa, Sheffield Brick & Tile Co.
G. H. Galvin, Rockford, Iowa, Rockford Brick & Tile Co.
C. C. Carhart, Sheffield, Iowa, Sheffield Brick & Tile Co.
Oscar Runyan, Auburn, Iowa, Auburn Brick & Tile Co.
B. F. King, Colchester, Ill., Colchester Brick & Tile Co.
G. S. Brubaker, Tecumseh, Mich., H. Brewer & Co. (Machinery).
H. P. Jenks, Vigo, Ohio, Hook Patent Kiln Co.
C. E. Travis, Sioux Rapids, Iowa.
Roy G. Smith, Canton, Ohio, The Bonnot Company (Machinery).
C. A. Marshall, Creston, Iowa.
George Schnurr, Fort Dodge, Iowa, Kalo Brick & Tile Co.
George E. Winter, Mason City, Iowa, National Clay Works.
H. L. Tramp, Creston, Iowa, Creston Brick & Tile Works.
Dwight T. Farnham, St. Louis, Mo., Emerson Co. (Effi. Engrs.).
G. C. Mars, St. Louis, Mo., Hydraulic-Press Brick Co.
C. B. Platt, Van Meter, Iowa, The Platt Company.
C. M. Keeler, Fort Dodge, Iowa, Lehigh Sewer Pipe & Tile Co.
H. L. McCombs, Desoto, Iowa, Desoto Brick & Tile Co.
E. A. Lounsbury, Corwith, Iowa, Corwith Tile & Brick Co.
Al Westerdorf, Davenport, Iowa, Davenport Brick & Tile Co.
Ray McHose, Nevada, Iowa, Nevada Brick & Tile Co.
Ned Pearson, Maxwell, Iowa, Maxwell Clay Products Co.
Wm. Johnston, Clayworks, Iowa, Johnston Bros. Clay Works.
C. J. Lawless, Lincoln, Neb.
John H. Waterman, Hooper, Neb., Builders Brick Mfg. Co.
R. D. Ferguson, Lincoln, Neb., Yankee Hill Brick Mfg. Co.
H. H. F. Waterman, Hooper, Neb., Builders Brick Mfg. Co.
G. E. Merriman, Omaha, Neb., Hydraulic-Press Brick Co.
Harold Copping, Philadelphia, Pa., Philadelphia Textile Mach. Co.
A. V. Bleininger, Pittsburgh, Pa., Bureau of Standards.
Chas. F. Binns, Alfred, N. Y., Alfred University.

THE CONVENTION OF THE ILLINOIS CLAY MANUFACTURERS' ASSOCIATION.

SPLENDID PAPERS, valuable discussions and enjoyable entertainments made the thirty-eighth annual meeting of the Illinois Clay Manufacturers 'Association one long to be remmbered.

While the attendance was smaller than expected, forty-six delegates paid close attention to the work and entered earnestly into the discussions so that many important matters were considered and disposed of. Never before in the history of the Association had such a splendid program been arranged. Almost every question of interest was handled by able men, whose valuable papers were important additions to ceramic literature. The testing of materials, the drying, burning, taking of kiln temperature, cost accounting, advertising and freight rates were among the many subjects discussed.

The clayworkers of the state of Illinois and surrounding territory are missing a grand opportunity of increasing their store of knowledge when they neglect to attend these most important meetings. Many of those present declared they would not have missed this convention for a hundred dollars, while one progressive brick manufacturer declared that he had received information that would no doubt save him over a thousand dollars during this year alone. It is inconceivable that the majority of clayworkers of Illinois can not appreciate the great good of associational effort. This brief review should prove to the absentees that they lost a golden opportunity for increasing their efficiency.

The convention was held at the Jefferson Hotel, Peoria, February 8, 9 and 10. The first session was called to order Tuesday morning with an address of welcome of the usual type by J. J. Crowder, city comptroller, who represented the mayor. Mr. C. W. Dull, of the chamber of commerce, also addressed the convention and in his humorous way extended the glad hand. Messrs. Giles and Kanne, local brick manufacturers, made short speeches showing the hospitality of the Peorians.

These addresses were responded to by Mr. F. W. DeWolfe, of the geological survey of Illinois. He thanked the several gentlemen in behalf of the association and then explained the importance of the clayworking industries of the state and the great opportunities still before them. There are 263 plants in Illinois making a varied line of clay products. There are immense and abundant deposits of raw material suitable for high grade vares not as yet manufactured in the state. He urged the members to develop these other lines—to educate the public concerning brick as the ideal structural material, the best for roads and the real value of other clay products for farm drainage, sanitation, etc. President Buckley then read his address.

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen of the Convention:

We are assembled here in convention again for the thirty-eighth annual meeting of this Association, which I believe is the oldest of its kind now in existence; and before calling your attention to certain matters which I feel are of interest to the Association, I desire to first take advantage of the opportunity to thank you for the honor conferred upon me at the closing session last year, in electing me your president. During the past year it has been my endeavor to keep the interests of the Association in the foreground, and I trust that my administration will prove satisfactory to all.

Notwithstanding the fact that a great and disastrous war has been raging during the entire year across the waters, and just across our Southern boundary line, we clay manufacturers, as a whole, have had quite a satisfactory year, and I predict even a better year is before us, as general conditions are, in my opinion, greatly improved over what they were a year ago.

It is true, that perhaps our manufacturers depending upon Southern trade have not had as satisfactory a year as the rest of us, and it is also true that the margin of profit has not been as satisfactory as it should have been, but upon the whole, I really believe the past year has proven to be, to the most of us at least, quite satisfactory.

The message that I particularly wish to bring to your attention is the thought of our national president at Detroit at last year's convention. At that time he urged greater co-operation with the government, with the state, with the community and with each other in the clay manufacturing industry. And he said that our government had rightfully undertaken to remedy some of the abuses that have crept into business and financial methods, but it will require the co-operation of the business men to make these remedies beneficial, rather than detrimental. It will require the combined effort of every rightful thinking citizen to uphold those in authority in order that our neutrality may be maintained with honor and dignity.

J. L. Buckley, Aledo, President.

Our government needs your co-operation more today than ever in its history. Our states are rightfully undertaking thorough legislation to provide for the victims of accidents in industrial pursuits, and to generally improve the condition under which labor is performed. Our legislators, however, are liable to become over enthusiastic and bring about conditions which will be harmful rather than beneficial to the very people they are striving to help.

It is our duty to ourselves and our fellow manufacturers to cooperate with one another and see to it that this legislation assumes the right form.

We are living in a day when community interest has developed to a large degree, and the men of questionable business and of questionable motives are rapidly losing their influence, and organizations of various kinds are being maintained to develop the community spirit and improve the living conditions in order that we and our children may have a better opportunity to become good and valuable citizens, and I respectively urge you to co-operate with these organizations.

I believe that we should co-operate with all of our fellow manufacturers engaged in the clayworking industry, and more particularly with those engaged in the same line of business that we are.

The greatest foe that we have today is without question concrete. It used to be that we that were engaged in the manufacturing of building brick considered that we had a product that met, to a very large extent, competition in lumber, but during the last few years, while we have known that we had the best building product in the world, yet we seem to be afraid to say very much about this in public, or rather to keep the public rightfully informed. While manufacturers of inferior competitive materials have used co-operative methods and placed their products where burned clay would have been by far of greater value to the user.

We have been using the most of our efforts against one another engaged in the same line of manufacture. It has been keeping us very busy telling the public that our particular kind of clay was of superior quality to our neighbor's. In my opinon personalities should be forgotten. Hearty co-operation will place our industry where it belongs, which we can never do fighting as individuals, or fighting among ourselves.

Our business is one of the most important in the world's progress, and is worthy of our best thought and ability in developing our particular business to the point of greatest usefulness to the public.

Much has been said during the last year or two with reference to cost accounting. Perhaps I might be considered a crank upon this thing, but I cannot help but believe that if all the clay manufacturers positively knew from month to month, or from pay to pay, the exact cost of the goods they are manufacturing, that the margin of profit for all of us would be much more satisfactory, as I have found that the competitor that actually knows the cost of his goods is not a bad competitor to meet in competition, and I trust that this convention will not adjourn without some definite action having been taken in connection with the uniform cost system.

It was my privilege a few days ago to listen to an address of our President, and Mr. Wilson's message was on "Preparedness," and I am sure that this association would do well to adopt this slogan, and to prepare for the great conflict we are meeting from day to day with competitive products.

THE CLAY-WORKER.

Members of the Ceramic Short Course at the Illinois State University, January, 1916.

In looking over the program that our efficient secretary has arranged for this convention, I feel that I would be doing you an injustice to take too much of your time, because I am sure that you will appreciate and be greatly benefitted by the strong program our secretary has arranged for us, and I sincerely trust that each and every one of you will be sufficiently interested to show each of the speakers that will appear before you the courtesy that is due them, and give them your undivided attention, and I feel that I would be unappreciative if I did not. at this time, thank our secretary, Mr. Huckins, for assuming the burden of arranging for your entertainment while attending this convention. Too much praise cannot be given him for his untiring efforts in your behalf, and it is, indeed, a privilege and pleasure for any man to be as closely associated with him as I have been during the past year.

I would also urge that this association take a greater interest in the Ceramic School that we have at Urbana than we have ever done before. This can be done, and I would urge that the members, as individuals, show their interest to a greater degree.

The Ceramic department of the University of Illinois, stands ever ready to lend us every possible assistance that they can, and are always glad to render any such assistance to us, as individuals, whenever they are called upon. I do not believe that the Ceramic department is receiving the just support of the clay manufacturers in this state which it deserves, and I have recently suggested to the head of the Ceramic department that invitations be extended to various clay manufacturers to appear before the students of the Ceramic department and discuss with them and for their benefit some of the problems that will confront the graduates when they get out in actual practice, and give the students an opportunity to ask questions that might assist them in their school work, and I strongly urge that we co-operate with the Ceramic department to the fullest extent of our ability, not only as an association, but as individuals as well.

I thank you. (Loud applause.)

The first formal paper on the program was by J. W. Lazear, of the Brown Instrument Company, on the subject, "Pyrometers." He told of the history of these heat measuring apparatus, described their manufacture and discussed the importance of their work in securing correct burning. Mr. Douglas Stevens, who discussed this paper, declared that pyrometers saved his company ten per cent. annually in the burning cost.

Mr. B. C. Radcliffe, of Urbana, Ill., then read a paper on "The Changes and Variations of Silica." He illustrated his talk with charts and a series of burned samples of two shales with definite amounts of sand increased regularly by ten per cent. The paper brought out the facts that the size of the particles of sand had a great influence on the plasticity of clay and the greater the amount of sand the less the plasticity and the greater the probability of the ware cracking. A body containing over seventy per cent. of silica is bound to crack.

Following a discussion on this paper, a representative of the National One-Cent Letter Postage Association made a brief talk urging upon the members to insist upon each class of mail being considered on its own cost so that heavy losses in some places and big profits in others would not be permissible.

Tuesday afternoon the delegates listened to the following: "Possibilities of Stoneware," by R. R. Danielson, Urbana, Ill., details as to work of making stoneware from Illinois clays, with exhibit of wares made in the Ceramic school. "Some Observations Among Clayworkers," by J. O. Trautwein, Chicago, an informal talk, brimful of good points emphasizing preparedness and correct accounting of depreciation on machinery and plant. "Effect of Varying Non-Plastics in the Shrinkage and Mechanical Strength of Sewer Pipe Clay," by C. C. Trischel, Urbana, illustrated by charts showing effect different amounts of grog, or sand and grog, and sand or grog and calcined clay had on the burning behavior. It was proven that sand tends to weaken while grog tends to strengthen givign maximum strength at 20 to 40 per cent. in mixture. "Short Course Impressions," by C. E. Carter, Peoria, an informal talk on his experiences at the last institute program at the ceramic department of the University of Illinois.

During this session committees were appointed to present resolutions on cost accounting and depreciation factors.

The afternoon program was closed with an interesting address by Commissioner of Public Works Eckley, on the subject of paving. He is a great advocate of vitrified brick paving so his address bristled with statements that tickled the clayworkers all the way through.

Tuesday evening during the course of a pleasant smoker the delegates were treated with a sketch from the pen of Playwright A. E. Huckins. Mr. Huckins, the untiring secretary, is a live up-to-the-minute brick manufacturer and although a busy individual devotes considerable time and effort in behalf of the clayworking industry.

(Continued on page 214.)

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

The Clay-Worker a Welcome Visitor.

Editor The Clay-Worker:

Kindly renew our subscription to The Clay-Worker. Check is herewith acknowledged. This welcome visitor does us worlds of good, and we take this opportunity of thanking you for its service.

Very truly yours,
KEYSTONE BRICK COMPANY.
Watsontown, Pa. Walter D. Parson, Sec.

Retires After Fifty Years of Service.

Editor The Clay-Worker:

Enclosed find $2.00 for which send The Clay-Worker in the future to Walter Watson, Yorktown, N. J. This is a farewell for me, as I have retired after fifty years in the brick business. I really feel that I am entitled to a little rest. I live about five miles from the plant, however, and whenever I get homesick my old Ford soon gets me over there.

Mr. Watson is my successor. I wish to thank you for the useful information I have had from The Clay-Worker all these years.

Yours very truly,
D. F. HAINES.

A Change in Location.

Editor The Clayworker:

Beginning with the next issue, my postoffice address will be changed from North Mountain, W. Va., to Matawan, N. J., in care of The New Jersey Company. In connection with the above, I beg to say I resigned my position as manager of the Adamantine Clay Products Company, which I held for the past four years, and beginning February 1, I will take the management of the New Jersey company's plant at Matawan, N. J., and I do not want to be without The Clay-Worker. Kindly forward same to me as requested above.

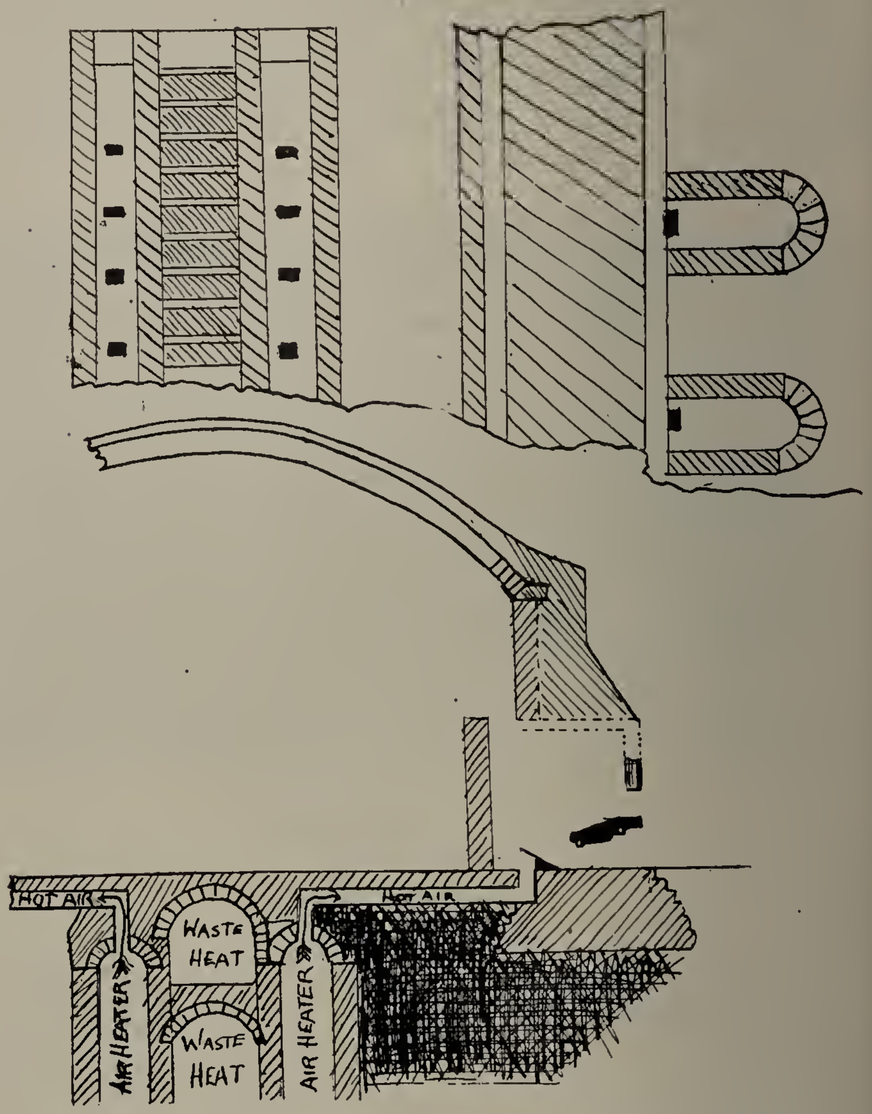
Yours very truly, J. H. THRESS.

Some Views on Clay Burning.

Editor The Clay-Worker:

In my last I may possibly be adjudged a bit severe on the "young," laboratory-made superintendent; it was written with the best intent advisedly, with, and for a purpose. I am in no sense an "uneducationalist"; on the contrary, I would like to see every mother's son have a technical course, although I remember once reading in a New York paper one-third of the graduates turned out jailbirds, which I then doubted. Had I sons, it would be my greatest ambition and effort to help them to a technical education, and constantly remind them of the moral that knowledge grounded on accuracy, aided by labor, prompted by perseverance, will finally overcome all difficulties. The most important position in a clay plant is the burning, without doubt, and this knowledge can only be acquired by years of laborious practical experience, which few graduates ever bend to; it rests, as I see it, then, for the rule-of-thumb man to aspire to raise himself to the advantage later on of a technical knowledge, when he should then be fit to be accredited a "practical" superintendent, better able to solve the intricacies of the most difficult and important jobs of the whole business. Unless he is thus equipped he would be better advised to look for results from his rule-of-thumb man, rather than constantly interfere, which only irritates, making things worse, as he, like the other fellow, thinks he cannot be taught; besides "too many cooks are sure to spoil the broth."

A very important improvement on the old way, which I find still universal in the states, is that of preventing all cold air possible from entering the burning kiln. All air necessary should be preheated for obvious reasons, particularly as it can be done by the waste heat of the kiln itself by substituting the useless kiln bottom flues I have referred to, converting them to work the reverse way, conveying the heated air to each fire box. So divided and equally distributed, the equal size of the flues uniformly regulates the heating throughout and maintains same. By this arrangement the two gases meet and explode in the throat of the fire box, thereby causing complete combustion of the gases and at the same time increasing the heat of the flames, which, in turn, increases the temperature of the air, which again increases the flames, and so on, that it is possible to attain any heat by a most economical method. It is thus that I would advise utilizing the elaborate kiln bottom flues which I call worthless, that are made for conveying the waste heat to the main waste heat flue.



Rough Sketch to Illustrate Preheating of Air.

This is a neglected subject which is of far more importance than the knowledge of how much carbon or alkali the clay contains. I have in my possession copies of reports of upwards of one hundred different district clays by several different chemists, none of whom state that either of one hundred samples contains "carbon," which is such a dreadful element, according to some of the would-be knowing ones, who make so much of that error to cover their inexperience and errors of judgment, when a kiln is spoiled which is more the rule than the exception. I can safely say, from what I can glean, the financially successful plant is more the exception than the rule, which bears out my contention that there is still a wide field for invention of improvements in kiln construction and burning.

I notice in December issue of The Clay-Worker suggestion in the firing of kilns, alternate fires, giving the reason, which is undoubtedly a good idea, but it is not new. This has been practiced with benefit many years to the writers' knowledge, but was found unnecessary where the closed fire boxes and preheated air flues are established. By these means you have a regulated supply of both gases without any interference of the cleaning out of the fires, which means, I presume, is resorted to, every twelve or twenty-four hours. This cleaning out, as it is termed, is also obviated by a method of short bars extending not more than 12 inches in a slanting direction into the fire box, resting on a strong cross bar, which should not be less than 2½ inches square, or it will bend with heat and weight of fire. The bottom end of the fire bars resting on this cross bar should be at least 9 inches above the floor; the top cross bar need not be so strong, 1¼-inch square wrought iron, or any similar strength, will suffice, and raised from 3 to 4 inches higher than the lower end, with an open space at front for cleaning out clinkers; arched over about 10 or 11-inch rise. This opening is partially closed up during firing with loose brick to prevent any hot fire falling out. These brick are readily removed and replaced after drawing clinkers from bars; the clinker forming and accumulating at lower end of bars can readily, and should, be kept drawn away frequently as it accumulates, thereby keeping the opening constantly clear and fires clean. This process occupies very little time, and the firemen will find it much simpler and easier than running the cleaning out for twelve hours, and far more beneficial to the kilns. These fire boxes are, in themselves, each a miniature gas producer and a great improvement on the old-fashioned open fronted fire boxes, either with or without bars. I have seen some bars that had better be on the scrap heap, especially the long ones extending in a horizontal position from front to back of fire box, with a dead wall at the back end. These are of use only for a short time after cleaning, when they soon choke up and become worthless; better by far be without them, for they are worse than worthless in this case. For stoke hole doors, the cheapest and most economical in every respect is a fire clay tile, made to fit the opening; and hung by wire from side of kiln, enabling same to be swung aside whilst firing operations, and quickly returned to place to exclude the inrush of cold air. A little study on this matter will plainly show it of far more importance than knowing the consistent elements of the clay. It is all very well to know this as a casual knowledge, but it won't burn it. I may here say I can analyze clay, but would never think of doing so for anything more than curiosity, particularly building material clay. There is a little more reason for ascertaining the constituents of fire clay, but not much. The all-important items of clay products, next to the burner with his head screwed on right, is the best and most suitable machinery and kilns. Machinery, as I have previously said, but there is no harm in repeating some things again and again, machinery has nearly reached perfection, but with kilns there is yet room for the burner to exercise his common sense or his "burning bump." I am enclosing you a sketch of improvements I have herein drawn attention to, but it must not be thought that I consider this even the best plan extant, for I don't.

This is merely a rough sketch (and pretty rought, too) to give an idea of what I mean about the preheating of the air. If anyone should like a correct drawing, I would supply for a consideration and contract the building if desired. The black squares are to represent the hot air. Ducts are not to any scale or regular form, but just to give an idea.

CLAYWORKER.

Clay Block Silos in Kentucky.

Editor The Clay-Worker:

Your article about Kentucky and concrete silos in the January Clay-Worker interested me considerably, because I had some experience selling clay block silos in that territory during the past two years. The fact regarding the state methods are these, so far as we learned in our canvassing: The state agricultural department recommends silos, and if the farmer cannot afford to buy one outright from some silo company, the state furnishes the forms for building a concrete silo and sends a man with these forms to start the work, all this at the expense of the state. I always had the impression, gained from my experience there, that the forms were furnished the state by the Polk Company; but who promoted this lovely arrangement I am unable to say. There is one thing to be said in defense of this proposition, however. Until the state took up this line of inducing the farmers to build concrete silos there were nothing but wood silos anywhere, and but few of them; and, as this cheapened the cost of a permanent silo to the farmer considerably, it was an aid to the whole of the permanent silo builders. There were few clay block silos being pushed in Kentucky, particularly western Kentucky, where we worked; and, as this country is handicapped by the terrific freight rates imposed south of the Ohio river, outside companies could hardly afford to enter the state. We built what was probably the first block silo in western Kentucky, and since that time have erected quite a few, and the business would have grown much faster had crops been better in that section. We had a little experience which will be of value to outside corporations.

A balance due on one of our silos had been standing several years, and on bringing suit, we found that we could not enforce our claim because of a law compelling foreign corporations to register with the state and pay a tax on all business done within the state. Kentucky has a number of such laws, which are made with good intentions but only serve to hold back the state. Kentucky is a good silo field, because the mild winters make silage feeding of cattle a profitable operation.

Our company, the Portland Silo Company and the Rockport Drain Tile Company, expect quite a silo business another year in Kentucky if the crops are good and we can induce the L. & N. to reduce its freight rates.

Yours,
W. C. HOLMES,
Springfield, Ill. Springfield Drain Tile Co.

AMERICAN PULVERIZER GIVES SATISFACTION.

The Decatur Brick Manufacturing Company, of Decatur, Ill., installed the largest size American Ring Pulverizer during the season of 1913 to crush and pulverize their shale mixed with clay and brick-bats, same for building brick, paving block, and hollow ware manufacture. The company recently placed an order with the American Pulverizer Company, East St. Louis, Ill., for another one of their largest pulverizers, No. 48, which will be installed by the side of the first one to do like work. It is fair to assume that said brick company investigated all types of grinding machinery prior to installing the American pulverizer in 1913, and it would be correct to assume that the pulverizer as installed in 1913 has maintained superior merit to a degree that its two years' operation has warranted the installation of another of the largest size of pulverizers in competition with all other types of grinding machinery. The Decatur Brick Company built a new and modern brick plant during 1912-1913, a plant that is unique in design, spacious in dimensions, and equipped throughout with latest type of machinery and handy devices to a degree that their plant is operated as near automatically as possible and is as complete as it is possible to design and build, to the end that quantity and quality of their output commands an extensive market.

One trouble with reformers and insurgents is that they are extremities and are never willing to let well enough alone but persist until they bring a reaction. That is what is happening now in connection with the safety first slogan. It has been carried to such freakish extremes that some reaction against it is setting in.

OFFICIAL ANNOUNCEMENT.

Thirtieth Annual Convention of the National Brick Manufacturers' Association and Allied Organizations, to Be Held at the Statler Hotel, Cleveland, Ohio, February 21 to 26, 1916.

The National Paving Brick Manufacturers' Association Will Meet at the Statler Hotel, Beginning Monday, February 21.

The American Ceramic Society Will Hold Its Eighteenth Annual Convention at Cleveland, Beginning Monday, February 21.

☞Reduced Railroad Rates Have Been Granted by the Central Passenger Association.☜

As PREVIOUSLY ANNOUNCED, the thirtieth annual convention of the National Brick Manufacturers' Association will be held at Cleveland, Ohio, February 21 to 26, 1916. Cleveland's central location makes it very convenient for a vast number of the clayworkers of the country. The splendid train service from all directions enabling the members to reach Cleveland conveniently and quickly insures an exceptionally large attendance.

Reduced Railroad Rates.

The Central Passenger Association has granted a low round trip rate from points in its territory and this has been concurred in by the Trunk Line and New England Passenger Associations. Under the concession, tickets may be purchased through to Cleveland, February 19, 20 and 22, and will be good returning until March 1, 1916. No certificate need be taken. Instead delegates will purchase round trip tickets for themselves and those accompanying them. Delegates coming from points south of the Ohio and west of the Mississippi may use their local mileage to such points as Cincinnati, Louisville, St. Louis and Chicago, and there repurchase tickets to Cleveland and return.

Statler Hotel Headquarters.

Again N. B. M. A. delegates will be afforded splendid hotel accommodations; the new Hotel Statler, with the recent addition, has 1,000 rooms, each with bath and toilet. The rate will range from $1.50 per day per guest up. They have 200 rooms at the minimum rate named, each having shower bath; another 200 rooms at from $2.00 to $2.50 per day, and 600 additional guest rooms at $3.00 per day and upward, owing to location, size of room, etc. In requesting reservations, delegates should state character of accommodations desired, number in party and date of intended arrival. Those desiring parlors or special quarters will be afforded same at reasonable rates for the accommodations desired, and the service will be Statler service, than which there is none better.

Convention Hall and Exhibition Room.

The sessions of the National Association will be held in the ballroom of the Statler hotel and a room adjacent thereto will be used as an exhibition room for the display of specimen brick, tile, etc., trade literature, etc. No machinery will be displayed in this room; those desiring to exhibit machinery may make arrangements to do so in their private rooms on application to the manager of the hotel.

Meetings of Affiliated Associations.

As in former years the auxiliary organizations will meet Monday and Tuesday in the various convention halls of Hotel Statler. The first session of the N. B. M. A. will occur Wednesday afternoon, February 23, at 2:00 p. m., and the convention will continue Thursday and Friday interspersed with such entertainment as may be afforded by the local entertainment committee. The smokerette will be held Wednesday evening, and the annual banquet Thursday evening. The following formal papers will be presented:

N. B. M. A. Convention Calendar

Monday, Feb. 21 10:00 A. M.	Meeting of American Ceramic Society, Lattice Room, Statler Hotel.
2:00 P. M.	Second Session American Ceramic Society.
2:00 P. M.	Meeting of Board of National Paving Brick Manufacturers' Association, Convention Hall Annex, Statler Hotel.
8:00 P. M.	Meeting Directors National Building Brick Bureau, Secretary's Headquarters, Hotel Statler.
8:00 P. M.	Third Session American Ceramic Society. Followed by a Section Q meeting.
Tuesday, Feb. 22 9:30 A. M.	Fourth Session American Ceramic Society, Statler Hotel.
10:00 A. M.	Business Session N. P. B. M. A. Board, Statler Hotel.
10:00 A. M.	Meeting of National Clay Machinery Association, Parlor Hotel Statler.
2:00 P. M.	Fifth Session American Ceramic Society, Statler Hotel.
2:00 P. M.	Business Session N. P. B. M. A., Statler Hotel.
3:00 P. M.	Opening Meeting National Building Brick Bureau.
7:00 P. M.	Informal Meeting N. P. B. M. A., Convention Hall.
8:00 P. M.	The Road to Happiness, which leads paving brick men and friends

N. B. M. A. Program.

First Session—Wednesday, February 23, 1916, 2:00 P. M.

Opening prayer, Rev. Louis F. Ruf, Cleveland, Ohio.

Welcome to Cleveland, by Hon. Harry L. Davis, Mayor of Cleveland.

Response, H. C. Kleymeyer, Evansville, Ind.

President's Annual Address, C. P. Mayer, Bridgeville, Pa.

Report of Treasurer, John W. Sibley, Birmingham, Ala.

Election of officers and members of standing committees.

Installation of officers.

Reports of standing committees.

1. "As Others See Us," an address by Wm. Ganson Rose, Cleveland, Ohio.
   Discussion led by Will P. Blair, Cleveland, O.
2. "Progress and Prosperity," F. W. Fitzpatrick, Washington, D. C.
   Discussion led by B. W. Ballou, Buffville, Kans.

Second Session—Thursday, 9:30 A. M.

3. "Insurance for Brick Plants," Hubert Somers, Atlantic City, N. J.
   Discussion led by J. W. Robb, Clinton, Ind.
4. "Recent Progress Toward the Standardization of Building Brick," Prof. Edward Orton, Dean College of Engineering, Ohio State University, Columbus, Ohio.
   Discussion led by F. W. Butterworth, Danville, Ill.

5. "The Commercial Side of the Brick Business," L. K. Brown, Zanesville, Ohio.
Discussion led by Eben Rodgers, Alton, Ill.

Third Session—Thursday, 2:30 P. M.

6. "Clay Testing" (Illustrated), H. B. Henderson, Columbus, O.
Discussion led by A. V. Bleininger, Pittsburg, Pa.
7. "Elements of Cost in Brickmaking" (Illustrated), R. D. Herbert, Nashville, Tenn.
Discussion led by W. A. Howell, Toledo, Ohio.
8. "What's the Matter with the Brick Business?" (Illustrated), Wm. B. Wreford, Detroit, Mich.
Discussion led by J. F. Reynolds, North Haven, Conn.

Fourth Session—Friday, 9:30 A. M.

9. "Transverse Tests of Brick in Relation to Strength of Piers" (Illustrated), J. G. Bragg, Pittsburg, Pa.
Discussion led by G. W. Rahjens, St. Paul, Minn.
10. "Efficiency Engineering for Brick Plants" (Illustrated), E. C. Hillyer, Raleigh, N. C.
Discussion led by J. Parker B. Fiske, New York, N. Y.
11. "The Use of Clay Products for Farm Buildings" (Illustrated), Homer F. Staley, Ames, Ia.
Discussion led by A. C. Ochs, Springfield, Minn.

N. B. M. A. Convention Calendar

Tuesday, Feb. 22	to the N. P. B. M. A. Exhibition at Complete Building Show, Coliseum.
8:00 P. M.	Sixth Session American Ceramic Society followed by Section Q.
Wednesday, Feb. 23 9:30 A. M.	Seventh Session American Ceramic Society, Statler Hotel.
10:30 A. M.	Meeting Executive Committee N. B. M. A., Secretary's Headquarters, Statler Hotel.
2:30 P. M.	First Session National Brick Manufacturers' Association, Convention Hall, Hotel Statler.
8:00 P. M.	Informal Reception and Smokerette, for ladies and gentlemen, Banquet Hall, Hotel Statler.
Thursday, Feb. 24 10:00 A. M.	Second Session N. B. M. A., Convention Hall.
2:00 P. M.	Third Session N. B. M. A., Convention Hall.
6:30 P. M.	Informal Reception, Mezzanine Floor, Hotel Statler.
7:30 P. M.	Annual banquet, Banquet Hall, Hotel Statler.
Friday, Feb. 25 10:00 A. M.	Fourth Session N. B. M. A., Convention Hall.
2:30 P. M.	Fifth Session N. B. M. A., Convention Hall.
8:00 P. M.	N. B. M. A. Night at Complete Building Show. All delegates and guests will again take the Road to Happiness leading to the Coliseum.
Saturday, Feb. 26	General sight seeing trips.

Fifth Session—Friday, 2:30 P. M.

12. "Old Versus New Methods of Trucking Brick" (Illustrated), Lemon Parker, St. Louis, Mo.
Discussion led by Ben H. Richards, Edwardsville, Ill.
13. "Safety in Clay Products Plants," C. A. Millar, Toronto, Ont., Canada.
Discussion led by R. G. Eisenhart, Horseheads, N. Y.
14. "The Burning Question," Anton Vogt, Troy, N. Y.
Discussion led by Marion Blair, Thornton, W. Va.
15. Reports of committees and miscellaneous business.

Questions for General Discussion.

In addition to the foregoing addresses and papers, various questions pertaining to brickyard practice will be discussed. Any member desiring information on any specific detail of the business may obtain same by submitting questions in writing to the secretary.

The Complete Home Show.

As the trade has been advised, there is to be a great complete Building Show at Cleveland, beginning Wednesday, February 16 and continuing until Saturday, February 26. The chief purpose of this great exposition is to demonstrate to the builders of the nation the importance of building incombustible structures. It is anticipated that the display will prove of great material value to the manufacturers of clay products for structural purposes. Ample time and opportunity will be afforded the delegates to visit this great exhibit which will be held in the Coliseum, a block east of Hotel Statler. No other building material has been improved in both form and color to the same degree of perfection as have brick and tile in the past decade, hence this exhibition ought to prove of great benefit to the clay crafts, every member of which will profit by visiting it.

The Road to Happiness.

Tuesday evening at 7 o'clock the members of the National Paving Brick Manufacturers' Association will assemble in the north wing of the convention hall of the Statler Hotel and listen to a brief discussion of the present condition and future prospects of the paving brick industry. All delegates and guests to the convention are cordially invited to participate and join in a trip, via "The Road to Happiness," to the exhibition of the N. P. B. M. A., at the Complete Building Show in the Coliseum, arriving there at 8 o'clock, when an informal reception will be held. Ladies participating will be given an appropriate souvenir.

Entertainment of Ladies.

A special local committee has been appointed to look after the comfort and entertainment of the visiting ladies. The latter are requested to register on arrival with the assistant secretary, so they may be given program of entertainment and souvenirs, tickets to theater parties, etc., etc.

A Reception and Smokerette.

Wednesday evening the delegates to the convention and those accompanying them, including the ladies (it's a smokerette), will be the guests of the local committee on entertainment at an informal smokerette in the banquet hall of the Statler. The chief feature of entertainment will be musical in character, during which the members will have an opportunity of renewing old acquaintances and extending the glad hand to new members.

The Annual Banquet.

The annual banquet, or associational dinner, will occur Thursday evening, at 7:30 o'clock, in the beautiful banquet hall of the Statler Hotel. It will be preceded by an informal reception on the mezzanine floor beginning at 6:30 p. m. Following the rule which has prevailed for several years, it will be a subscription banquet under the direction of the N. B. M. A. executive committee, assisted by the local committee. A number of eloquent speakers will respond to appropriate toasts. The ladies will grace the occasion, as usual, and full evening dress will be in order, though by no means necessary.

Convention Sessions.

As in former years, convention week will be divided by the N. B. M. A. and affiliated bodies, including the American Ceramic Society, the National Paving Brick Manufacturers' Association and the Clay Machinery Manufacturers' Association. Any other kindred associations desiring to hold meetings will be afforded facilities for doing so.

Souvenir Badge and Number Button.

An appropriate souvenir badge and number button will be presented to each visitor with the compliments of the Cleveland executive committee. The badges and buttons will be distributed by the secretary of the N. B. M. A. at his headquarters on the mezzanine floor of the Statler Hotel, where visitors are requested to call and register on arrival.

All sessions of the national convention are open to the public. Those who are interested directly or indirectly in clay work of any character or the use of clay products of any sort are invited to join the association and participate in the proceedings of the convention. Members and their families or friends who may accompany them will be expected to participate in all the entertainments and proceedings.

Those desiring further information as to requisites of membership in the N. B. M. A., formal program, etc., are requested to communicate with the secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,
C. P. MAYER, President.
THEO. A. RANDALL, Secretary.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXV. FEBRUARY, 1916. No. 2.

CURRENT COMMENT.

Statler, Cleveland.

* * *

N. B. M. A. 30th annual convention.

* * *

The first American Complete Building Show.

* * *

Big doings the whole week of February 20 to 26.

* * *

The first session of the N. B. M. A. will be held Wednesday afternoon, February 23, at 2 P. M.

* * *

Monday, February 21, the convention week will start off with meetings of the National Paving Brick Manufacturers, and of the American Ceramic Society.

* * *

The smokerette was an experiment last year but it is now an established function and the annual smokerette will be held Wednesday evening with the annual banquet Thursday evening of the convention week.

* * *

Those in charge of the Complete Building Show are promising some pleasant surprises and many big features and the show will have been completed in every respect and in good shape all around by convention week.

* * *

Cleveland has the best paved streets and roadways in the country, and now let us make the Cleveland convention pave the way to the biggest campaign for boosting building brick that has ever been known before in this country.

* * *

Pretty good evidence of the returning prosperity to the country has been furnished by the large attendance at the many conventions held so far this winter. This should mean not merely enthusiasm at the brick convention but also that the enthusiasm for better and bigger times should be carried home and put to work.

* * *

This ought to prove an excellent spring season for drain tile because the agriculture people are prospering and there has been enough rain this winter to impress the need of proper drainage.

* * *

Motor trucks are not only factors of importance in delivering brick but they can also be made factors of some importance in the game of advertising the building brick business.

* * *

One of the problems that many a clayworker will face this year will be that of how to produce the greatest quantity of good brick within a given time to meet the needs of the trade.

* * *

Whether they are really sincere or not remains to be seen, but on the face of the evidence at the present time the government authorities are proposing now to help boost business instead of trying to bust big business.

* * *

The face brick business is one that has made steady progress with but few fluctuations and it has had a pretty busy time of it the past six months and ought to break its splendid record of past achievements during the present year.

* * *

Preparedness is the order of the day all around now and if you are not thoroughly prepared for the lively demand of the busy building season you had better get in touch with the machinery people while at the convention and hustle those preparations along.

* * *

The enthusiast is seldom carefully balanced. If he were he would not be so enthusiastic, therefore it is easy enough to find fault with and criticise the enthusiast, but just the same they are mighty useful people because they stir us up and inspire us to do things that we would otherwise neglect.

THE GOOD ROADS CONVENTION.

The good road folks are going at the matter of their annual association work right this year and will have their convention the latter part of February, so that everybody can be well informed and in a position to make the most out of the season in good roads building. The annual convention and good roads show is to be held at Pittsburg during the week beginning February 28, which makes this the place and the time to get the latest and best information on the subject of building good roads and the machinery and material with which to do it.

WITH THE BRITISH POTTERIES.

Quite an extended report on the British pottery industries and regulations has been furnished by Consul Robt. S. S. Bergh, Stoke-on-Trent, England, in the daily commerce report of January 27, 1916.

Speaking of the commerce with the United States during the calendar year 1915, he says that the articles invoiced at the American consulate at Stoke for the year were valued at $2,053,649, compared with $2,330,953 for 1914. About half of this was decorated earthen ware. Quite an item was decorated chinaware, white earthenware, Rockingham ware, etc., while perhaps a quarter of a million dollars worth was silk and cotton embroidery thread.

The report is given over mainly to a digest of conditions and improvements as a result of regulations in the pottery industry in that country pertaining to lead poisoning and to the welfare of employes generally. It is said that some misunderstanding still arises in regard to some features of the regulations but these are being gradually worked out and the industry is showing improvement both in the condition of employes and in prospect for future business and profits.

SILO SITUATION IN KENTUCKY.

Some interest has been manifested in the silo situation in Kentucky since the publishing of a story in The Clay-Worker of certain state officials exploiting concrete for this purpose down there. The situation so far as clay silos in Kentucky is concerned is one in which there has not been enough active exploitation to make much of a show, but perhaps with the interest now aroused clay products will get into the game there and make some show.

The lumber people have been hot after the agricultural department of the state and the experimental division of the state university and they have promised to see that the state totes fair and that the employes and o..cials of the agricultural department do not show active partiality for one material over another.

The attitude of the lumbermen is that the agricultural department should exploit silos, that is should experiment with them and inform the farmers of the benefits to be had by their use and thus encourage this form of improvement. And when it comes to the matter of materials, let the material men fight their own battles on this point.

So conditions should prove better in Kentucky now for the active exploitation of clay products in silo construction than they have been heretofore, for the silo subject is quite a lively one there now because of the agitation started last fall because of the state's activities in exploiting concrete and the furnishing of forms for making concrete silos at a nominal charge of $5 with a man to superintend the work if desired.

LOCAL EXPLOITATION.

Just what can be accomplished in the way of business building by individual advertising in local territory, was the subject of discussion at one of the state conventions of retail dealers in building material. The discussion developed some interesting and more or less startling information. One man in a comparatively small town told of co-operating with other merchants and spending a little more than $200 in one campaign that practically doubled his business for the year.

Another man told of systematically spending $2,000 annually in newspaper advertising, and he figured that this, together with the use of wagon signs and circulars had increased his business 50 per cent.

Still another man who has been an extensive advertiser periodically, and has analyzed the subject carefully, gave it as his opinion that advertising is an unknown quantity; that is, we never know exactly the amount of results that will come from it. We do know that it does good, and the only feature that is unknown is the amount of good that may be accomplished. This is a little difficult to check up. He said they advertised extensively for several years and built up a splendid business. Then, because their advertising appropriations had grown somewhat burdensome, they cut it out, saved money for a while, and then they felt their business going down again and realized they must take up advertising once more. They have taken it up using newspapers, bill boards and circulars. They find that their business is increasing again, consequently they propose to keep at it.

In short the opinion expressed by all who would advertise was that it does good and is the one best and surest way to keep before the people and enlarge business. The only questions involved are, how it may be best done, and how much good can really be accomplished. That it does good and is worth while no one who has ever experimented with local advertising seriously will dispute for a moment.

THE BRICKMAKER'S OPPORTUNITY.

There is no man in a position to do local advertising at less expense with a chance for greater returns than the brick manufacturer. He has a product that is dependable and that has not been exploited as it should be, and one that for this reason has much room for extension in its use. There is room to practically double the amount of building brick consumption in every community where home building is going on by proper exploitation.

Some good brick advertising can be done at a very nominal cost. The "Build With Brick" signs, which have become famous all over the country and have led to similar efforts at slogan phrases by others, cost but little to buy and put up, and a liberal distribution of these will result in publicity that will perhaps pay more for the amount invested than any other form of advertising. So the ground work or outline for local exploitation can be had for a mighty small sum. This should be followed of course by the use of space in local papers and by distribution of circulars, the cost of which will vary in different localities and must be guaged by one's surroundings and inclinations.

The important point is to get firmly impressed the fact that local advertising pays. With this fact continually in mind to stimulate action it should be comparatively easy to decide upon ways and means for carrying out the work.

MAKING CREDITS BUSINESS-LIKE.

One of the things the brick manufacturer should manifest a keen interest in, not morely some time in the dim and distant future, but right now before the busy building season starts, is that of putting credits on a business-like basis.

Credits are essential in the conduct of business, but it is the open credit without anything more definite to show for it than an entry in one's books which makes most of our trouble and causes cramps in the capital supply of business building.

We have a habit of allowing a building contractor, for example ,a certain amount of time to put material into the job, complete his job and get his money before paying. This time may vary from thirty days to a year and will perhaps average three months. Meantime there is not only a loss of interest on the money invested and quite a lot of capital of the brick man tied up in this way, but the credits are in such indefinite shape that they are not a satisfactory banking asset.

They have a better way of doing things of this kind in France which we may well study and copy after with modifications. In France no matter how small the purchase that is made by a retailer or by a contractor, the man selling him draws a bill of exchange on him for the amount payable in thirty, sixty or ninety days, whatever the time of the credit extended. Then this bill becomes available for discount at the bank. Not only that but it is used in this way and it is said the bank of France rediscounts hundreds of millions of francs of this sort of paper every year, most of it for small amounts.

We need to get away from this careless habit of extending credit desired in our loose happy-go-lucky manner. Our loose methods of extending credits not only makes bank borrowing difficult, but it is a standing invitation to procrastination in settlement of accounts. The man owing a bill that is represented by nothing but a charge on the seller's books may pay when it is due, and then again he may figure that a week or two or even a month more will not hurt. So he develops a chronic habit of taking more time, whereas if this bill were in the form of a draft or note, and discounted at the bank he would receive notice and be expected to pay it promptly when due. There is evident need that we should tighten up our credit system and make it more business-like. When so many thousand brick are sold for a specific purpose the making of credits should be in definite form and the account should be properly closed either by notes bearing interest or drafts due within a fixed period. Then the man selling is in a position to utilize these as collateral if needed to finance his own operations, and also they will serve the good purpose of stimulating prompt payment.

We have all theorized quite a lot upon this subject and the time is here now for action. Let us extend credits, extend them judiciously, but in doing so let us make them business-like and put them in such a form that the evidence of credit or indebtedness will be good collateral for use at the bank.

CONVENTION POINTERS.

(Continued from page 165.)

W. D. Richardson, one of the pioneers in convention work, announces that he will exhibit complete detail drawings of a new producer gas fired continuous kiln in room 1034, Hotel Statler. A cut of this kiln is shown on page 235 of this issue. Those of our readers who are not fortunate enough to get to the convention, but are interested in this kiln and other matters mentioned by Mr. Richardson in his ad are requested to write the Ceramic Supply & Construction Company, Columbus, Ohio.

Fate has many good things in store for the brick and tile men who will congregate at Cleveland convention week. As will be seen by ads on pages 205, 246 and 247, they will have a suite of rooms on the third floor where the senior member of the firm, H. H. Fate, and a number of his associates will keep open house. Every delegate to the convention is expected to call at rooms 343 and 345 and investigate the new and novel Fate machanisms without which no plant is really up-to-date. These devices are illustrated in their recent catalogue, a copy of which can be had on application to The J. D. Fate Co., Plymouth, Ohio.

Greendale Rug Brick will be in evidence at Hotel Statler convention week, as will also the redoubtable Daniel E. Reagan, president of the Hocking Valley Products Company, Columbus, Ohio, who will extend the glad hand to all visitors and explain in detail why Greendale Rug brick are unsurpassed as a building material. He will also have on display a model of the American Ideal Paving Brick Roller die and samples of the ideal paver. He will have headquarters in Parlor A. A cut of the machine for making Rug brick is shown on page 138 of this magazine. Conventioners who call at Parlor A will be given a souvenir catalogue, which is a work of art, showing Greendale Rug brick in actual colors.

The Royal Line of Brickmaking Machinery made by the Chambers Brothers Co., Philadelphia, Pa., is well illustrated and tersely described in an interesting leaflet just issued, a copy of which the firm will be glad to mail to any brickmaker in the land who is looking for high grade brickmaking equipment. Two pages are devoted to their Multiple Brick Cutter No. 10, and a letter from the Excelsior Brick Company, of Fredonia, Kansas, is quoted, saying in part: "We consider this cutter the best purchase we have made in the machinery line since we have been in the brick business. After five months' continuous service this machine is doing perfect work." Interested readers are requested to write for the leaflet. Representatives of the firm, Messrs. J. H. Chambers and A. R. Root, will be at the Statler, convention week, and will gladly impart further information in regard to this and other Chambers machinery and equipment.

A GOOD START FOR 1916.

The coming season bids fair to be one of unprecedented prosperity for nearly every one connected with the clayworking industry. The Ceramic Supply and Construction Company, Columbus, Ohio, is getting a good start, and reports having done more business in January than in the last four months of 1915.

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CLAY RATE INCREASE SUSPENDED.

The proposition to increase the freight rate on clay from Mayfield, Ky., to Ohio river points and points north, approximately 5 per cent. have been given a quietus for the time being at least by a decision of the Interstate Commerce Commission at Washington. Mayfield supplies quite a lot of pottery clay to various points in the middle west and a new rate had been promulgated to go into effect March 16 which would increase the rate to Ohio river points and points beyond something like 5 per cent. This proposed increase has been suspended now until May 16 presumably for the sake of further investigation.

CLAY MODELING AS CURE FOR INSANITY.

Clay modeling as a cure for insanity has succeeded golf at the State Hospital for the Insane at Elgin, Ill., according to an announcement by Dr. George Zeller, of Peoria, alienist of the State Board of Administration. "Golf is impossible in the winter for most of the patients, but clay modeling is a year-round occupation that takes the patients' shattered minds off their troubles," said Dr. Zeller. "Miss Helen Morton, of Wheaton, Ill., has been secured as an instructor. She is prominent in society there, but gave up her social life to instruct the unfortunates at Elgin. We have fitted up a studio for her at the hospital, and she is serving without compensation."

Smile and the world smiles with you,
Knock and you go alone;
For the cheerful grin will let you in
Where the knocker is never known.

PEDIGREED STOCK!

Have you ever thought about the "Pedigree" of what you buy?

The "Pedigree" goes far back and is a guarantee of "Quality" and "Endurance".

The Pedigree is always counted as more important than the price because "Quality" and "Price" depend up it.

If the "Pedigree" is so important in stock, why isn't it even more important in MACHINERY?

The "Machinery Pedigree" is also a guarantee of "Quality" and "Endurance."

We are the builders of a"Pedigreed" line of Clayworking Machinery. Its Quality dates back for half a centuary or more and we have been continually striving to improve that"Quality" and "Endurance.'

Our line includes every machine and appliance required for making every class of Clay Products by all processes.

Increased output and low cost of operation and maintenance are two of the qualities of our improved line.

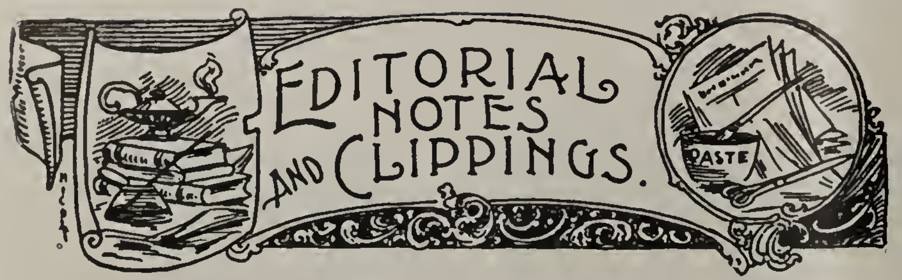
Our Haigh Continuous Kiln is a fuel, labor and money saver. Our Clayworkers' Steam Shovel is especially designed for the Clay Plant.

Our new No. 96 Bulletin, just issued, tells about a lot of these things. We will gladly send it on request.

THE AMERICAN CLAY MACHINERY CO.

BUCYRUS, OHIO,

U. S. A.



EDITORIAL NOTES AND CLIPPINGS.

Williston, N. D., is to have a new brick plant.

M. Heckard & Sons contemplate a number of improvements in their brick plant at Canton, Ohio, putting in a new equipment for the manufacture of paving brick.

William Henneman, who recently purchased the brickyard of J. B. Heirault at Eau Claire, Wis., is now puting the plant in working order, and expects to be turning out brick once more at the rate of 25,000 per day.

A certificate of incorporation has been issued to the Berkshire Brick Company, of Cheshire, Mass. The firm consists of John H. C. Church, Charles H. Booth and T. Ellis Ramsdell, and the capitalization is $150,000.

A new concern has been formed to manufacture the Berwald triple air space silo block to be known as the American Silo and Material Company with headquarters at Davenport, Iowa. Walter E. Berwald, formerly with the Davenport Brick and Tile Company, will be the manager of the new company.

The Coffeyville Vitrified Brick and Tile Company of Coffeyville, Kans., will move into new offices in the Terminal Building which will give the company much more commodious and more centrally located quarters. An elaborate display of brick will be installed.

Geo. J. Ollmann, president of the Kanapolis Clay Products Company, Kanopolis, Kans., advises us that he is now manufacturing dry press, face and fire brick, but that he expects to install a stiff mud equipment for the manufacture of brick and tile the coming spring.

Charles Bakke, general contractor, and W. J. Elliott, general manager of the North Dakota Pressed Brick Company at Dickinson, N. D., have organized a company for the manufacture and sale of silo tile. The name of the new company is the Dickinson Vitrified Tile Silo Company.

At the annual meeting of the Dysart Brick & Tile Company, of Dysart, Iowa, the reports of the officers showed a most satisfactory business for 1915. The following officers were elected: President, C. E. Zobel; vice-president, George Lammers; secretary and treasurer, M. S. Barnes. W. J. Wetzstein was retained as manager.

The Bridgeport Brick and Tile Company, of Bridgeport, Texas, has been granted a charter. The incorporators are Ben J. Tillar, W. T. Simmons and A. J. Clendennen, all of Fort Worth. The company was organized to take over the property of the old Wise County Brick Company, which was recently sold at a trustee's sale, and the plant will be put in operation immediately.

At a recent meeting of the stockholders of the Gem City Press Brick Company, Quincy, Ill, it was stated that prospects for 1916 are exceedingly good, and the company now has orders on the books for between 700,000 and 800,000 brick. The following officers were elected: President, Ezra Best; vice-president, Fred W. Wilms; secretary and manager, John T. Hummert.

The annual meeting of the stockholders of the Standard Brick Company. Crawfordsville, Ind., occurred January 28. The report of the manager, Ray Thomas, for the year 1915 showed a decided increase in output and an improvement in equipment during the year. Six new kilns have been completed, foundation laid for another, a lot of new machinery has been installed and the plant made more efficient generally. Officers were lected as follows: President, Fred S. Coulter, Frankfort; secretary-treasurer, Edwin M. Brown; manager, Ray Thomas; director, Walter Brown, of Frankfort.

The annual meeting of the Central Connecticut Brick Exchange was held January 24. The following directors were elected: R. D. Murray, Frank H. Holmes, Reginald Towers, M. H. Donnelly, Henry S. Tallard, George H. Stark of Hartford, J. C. Lincoln of Berlin, J. J. McDonnell of Middletown and B. H. Hibbard. Reginald Towers is the only new director. At a meeting of the directors shortly afterwards, the old officers were re-elected. They are: President, Joseph Towers; vice-president, George H. Stark; secretary, Frank H. Holmes; treasurer, Henry S. Tallard; executive board, Messrs. Tallard, Stark, Holmes, Murray and Lincoln.

The American Brick Company, of Chicago, Ill., has been incorporated by H. H. Randolph, Andrew Malinovizky and William R. Watson, with $25,000 capital stock.

John J. Moroney, the president of the Chicago Brick Machinery Company, Chicago, writes that his firm had the best business in January of any month for a year or two, and that indications are good for a busy season.

Dennis Leahy, of Pence Springs, W. Va., announces that he has contracted for the sale of the entire output of his plant for 1916, and contemplates the immediate building of an addition to his plant for the purpose of manufacturing paving brick.

The plant of the Athens Fire Brick Company, of Athens, Texas, was totally destroyed by fire January 31. The loss will probably reach $35,000, on which there is some insurance. Fire was caused by the bursting of a fuel pipe. The plant will be rebuilt at once.

The Mississippi Valley Manufacturing Company is getting everything in order to manufacture brick at the plant at Fort Madison, Iowa, as soon as the weather becomes settled. The plant has a capacity of 40,000 brick per day, and contracts are now coming in that insure a steady run for many months.

A new concern recently incorporated in Missouri is the Fuller Process Company, of Kansas City, with $10,000 capital stock, all of which is paid up. The incorporators are Claude E. Fuller, C. S. Monroe and R. C. Penfield. The purpose of the company is the treating of clay and cement brick and other porous material in order to add to their durability.

In common with most of the brick manufacturers of Connecticut, Brower & Best have experienced a very busy season, and the prospects are good for an even better trade the coming year. In fact, they have now under consideration an offer for their entire output for the next two years. They recently installed equipment for running their plant at Thomsonville by electricity.

Several hundred brickyard employes of Detroit, Mich., went out on a strike the first of the month, and as result most of the brickyards were seriously handicapped for a day or two. The men asked for a general raise of 50 cents a day, and a settlement was reached within a short time. The terms of settlement provide for a 25 cents raise, effective February 7, and the additional 25 cents a day beginning May 1.

Charles Weelans, who for several years has been the resident manager of the Monument Pottery, of Trenton, N. J., recently retired and with him his two brothers, Robert and Henry, who have been actively identified with the pottery for some time. George E. Hoffman, who has been associated with Mr. Weelans in the operation of the plant, has been placed in charge of the work by the owners, L. Wolf Manufacturing Company, of Chicago.

An immense sewer which will involve the expenditure of a large amount of money, is being planned for the drainage of Maumee river property. This will abolish the present plan of emptying sewage into the Maumee river. A large main sewer will be constructed from Toledo city limits to the village of Maumee, and a sewage pumping station would be erected at Wildwood, at the outskirts of Toledo. The local sanitary engineers are now conferring with authorities from the office of the state board of health relative to the matter.

The annual meeting of the Corry (Pa.) Brick and Tile Company was held at Warren, Pa., January 15. The following officers were elected: President, John L. Stone; secretary and treasurer, A. J. Hazeltine; general manager, D. Warren DeRosay. The board of directors voted to add more kilns and install a new ten-track dryer, which will nearly double the capacity of the work. The year 1915 was the largest in the history of the concern, and the outlook for 1916 is very promising. The factory is now running at full capacity and is shipping 30,000 brick per day on contract for 750,000 for the big Atlantic Refining Company power house being constructed at Franklin, Pa.

The plant of the Trent Tile Company, Trenton, N. J., was recently sold at receiver's sale to Charles D. Case. Last summer, following financial trouble a receiver was appointed, since which time business has been carried on at a profit. The company has been reorganized and the following officers have been elected: James L. Silvers, president and treasurer; Wiliam J. Jamieson, vice president and general manager, and Edward H. Sweeney, secretary. Mr. Case is one of the principal stockholders. Mr. Silvers, who was elected president,

(Continued on page 204.)

TRADE B MARK

Barrett's PAVING PITCH

Twelfth Street Trafficway Viaduct—Built by City of Kansas City, Mo. Waddell & Harrington, Consulting Engineers, Kansas City, Mo. Graff Construction Co., General Contractors, Seattle and Kansas City.

A Good Paving Job on this Viaduct

HERE is the great, new Twelfth Street Trafficway in Kansas City. There are roadways on it at two levels and both are paved with wood blocks.

The joints of the blocks are sealed with Barrett's Paving Pitch..

This filler will last as long as the pavement.

It will maintain a waterproof seal in all weathers and seasons, contracting and expanding as heat, water or frost may develop in the paving,

When Barrett's Paving Pitch is used *every joint is an expansion joint.*

Hundreds of miles of brick, wood and granite block pavements in American cities are made proof against seepage of water and damage by expansion by the use of Barrett's Paving Pitch.

Booklet and further information on request.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria
The Paterson Mfg. Co., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

EDITORIAL NOTES AND CLIPPINGS—Continued.

has been connected with the concern for over twenty-five years.

The office of the Goss Brick Company at Ruston, Wash., was entirely destroyed by fire recently.

C. W. Field, of Ponca City; Dave Oliver and J. G. Ramsey, of Blackwell, Okla., have incorporated the Ponca City Buff Brick Company, with $75,000 capital stock.

The Oskaloosa Vitrified Brick Company will make a number of improvements at its plant at Oskaloosa, Iowa, including the installation of a new power plant and probably a new system of burning.

At a recent meeting of the stockholders of the Evens & Howard Fire Brick Company of St. Louis, Mo., the following directors were elected: Henry Boeckler, Frederick Vierling, Cecil D. Gregg, John F. Lee and Edward Flad.

The employes of the Mt. Savage Fire Brick Works, Mt. Savage, Md., which is owned by the Union Mining Company, were surprised January 15 when the general manager, S. J. Aldone, notified them that the company had decided to increase their pay.

Extensive improvements are being made at the Canton plant of the Warren B. Ferris Brick Company, of Columbus, Ohio, which will increase the capacity of this plant from 30,000 to 40,000 brick per day. The company recently increased the capital stock from $50,000 to $100,000.

Maurer & Young, brick contractors of Great Falls, Mont., contemplate establishing a brick plant of about 20,000 daily capacity at Havre, Mont., in the spring, and write that they will be in the market for a dry press, a nine-foot dry pan and other machinery and supplies. They will buy second-hand machinery if it is good.

At the annual meeting of the Red River Valley Brick Company at Grand Forks, N. D., A. I. Hunter, who has been president of the company for ten years, was presented with a diamond ring by the stockholders in appreciation of the good work which he has done, and in addition re-elected him president for the ensuing year.

Charles W. Parks has been elected superintendent of the Adamtine Clay Products Company at North Mountain, W. Va., to succeed J. H. Thress. The North Mountain plant is now almost ready to resume operations after having been completely rebuilt following the big fire there last September. The plant will have a capacity of 50,000 brick per day.

John R. Copeland, president of the Copeland-Inglis Shale Brick Company, Birmingham, Ala., and Mrs. Blanche Lemert Wise, of Bucyrus, Ohio, were married at the Royal Poncianna hotel, in Palm Beach, Fla., the latter part of January. The couple went to Cuba on their honeymoon trip, but will make their home in Birmingham where Mr. Copeland has been so long identified with the brick business.

A new $40,000 brick and tile plant has been organized at St. Anne, Ill., by Fred H. Meier, formerly president of the St. Anne Brick and Tile Company, who recently disposed of his interest in that concern to U. Coty, secretary of the company. Mr. Meier thinks there is room in St. Anne for another company, and expects to start work on his new plant within a short time Mr. Meier writes that he will be in the market for machinery, engines and boilers, and in fact a full line of equipment for a modern brick and tile plant.

Frank S. Gery and A. A. Gery, of Reading Pa., owners of the Wyomissing Brick Company, have recently purchased the brick factories at Wyomissing and Mentello and the shale deposits at Vinemont from the Perkiomen Company. All these properties were formerly owned by the Montello Brick Company and were later purchased by the Perkiomen Brick Company when the trouble in the Montello Brick Company arose some years ago. The purchase price is given as $125,000. These plants give the Wyomissing Company a combined output of 80,000,000 brick a year.

The clayworking plants at Ottawa, Ill., were all more or less damaged by floods the latter part of January. The National Fireproof Construction Company, whose plant is located on the north shore of the Illinois river, probably suffered the heaviest loss, due to the fact that the water seeped through, filling almost every kiln on the plant, running over one hundred tons of green ware. At the Pioneer Company the pits were flooded and some damage done to the steam shovels. The Chicago Retort and Fire Brick Company was forced to close its plants for a few days on account of the flooding of the clay pits, but the factory escaped any serious damage.

The Pocahontas Brick Manufacturing Company, of Pocahontas, Ark., has been organized by Joseph Blatz, Joseph De Clerk, Joseph Peters and others.

The Diamond Sewer Pipe Company has resumed operations at its Uhrichsville, Ohio, plant after an idleness of over six months. Orders are on hand to keep the plant running steadily for another twelve months.

Jacob J. Boyer, Milton J. Boyer and John W. Rhode, all of Kutztown, have taken over the property of the Stimmel Brick Yards at that place. The plant will be greatly enlarged, and operations will begin within a very short time.

The brick plant of F. R. Carter, at Peoria, Ill., was closed January 20, for the balance of the winter, following an unusually busy season. The plant is usually closed about a month earlier than this. A number of improvements will be made during the shut down.

The West Virginia Paving and Pressed Brick Company at Huntington, W. Va., will make a number of improvements in the plant, including the installation of a new pug mill and the building of three down-draft kilns. The improvement will enable them to increase the daily capacity of the plant from 80,000 to 100,000 brick.

The Utica Fire Brick and Clay Company of Utica, Ill., has been incorporated with $60,000 capital stock by George I. Deitrich, George J. Gleim and Ernest A. Gleim. The company owns a fire brick plant at Utica as well as some clay beds near by and will operate the fire brick plant from now on at the rate of 40,000 brick per day. In addition they will mine and ship raw clay.

The Shale Brick and Fireproofing Company, of Pine Hill, N. C., has recently been organized, with $100,000 capital stock. C. M. Thomas is president; James L. Wall, vice-president and general manager, and Joel R. Hill, secretary-treasurer. The company has acquired the property of the Dan River Brick Company and will remodel the entire plant, including the installation of down-draft kilns. In addition to paving brick, the company will manufacture fireproofing materials.

S. E. Cullum, superintendent of the Duluth Clay Products Company, which is erecting a large brick manufacturing plant at Tower, Minn., is pushing the work of construction as rapidly as possible. It is hoped to have the plant in operation by early spring, turning out 150,000 brick per day. The plant will be equipped throughout with the most modern machinery and appliances and will turn out in addition to common building brick, fire brick, face brick, hollow block, tile and silo block.

The annual meeting of the Purington Paving Brick Company, Galesburg, Ill., was held January 19, when the following directors were elected for the ensuing year: George C. Prussing, Chicago; C. B. D. Howell, Chicago; P. T. Walsh, Davenport; W. E. Phillips, Galesburg. In turn the directors reelected all of the officers as follows: F. G. Matteson, president and treasurer; George C. Prussing and C. B. D. Howell, vice presidents; W. H. Terwilliger, secretary; W. G. D. Orr, general manager. The company report an unusually good year for 1915.

1916 ANNOUNCEMENT

We want a SWIFT SLACK COAL BURNING KILN and a SWIFT HOT-FLOOR DRYER in your vicinity. If there are none—to the first one answering this ad we will furnish one or both PLANS at a cost of the plans alone.

Drop a line to

SWIFT

Lock Box 269, OTTAWA, ILL.

The Wise Man of FATE

Fate Free Service Men Will Be at Cleveland Convention Week

Fate Free Service Men will be at Cleveland when the various conventions meet Feb. 21-26.

They'll be at the Hotel Statler—in Convention Hall—in the streets—everywhere.

They'll be there to answer questions about the Convention—about Cleveland—about everything you want information on—

You'll Know Them by This Badge—

"Ask Fate"

Pinned to the coat lapel of every Fate Free Service Man will be this badge, "Ask Fate."

Look for the badge and put up to its wearer any question you want solved—

Questions about the Conventions, directions about the city—anything, anywhere, any time—"Ask Fate."

Questions about difficult problems in your plant—big or little—"Ask Fate."

The latch string will be on the outside at Fate Free Service Men Headquarters in the Hotel Statler—

Two large general reception rooms—Nos. 343 and 345, will be open at all times, with a Fate Free Service Man at your beck and call.

The guest rooms—Nos. 330, 332, 334 and 336 adjoining—all in one suite, will be open for private consultation to all our friends and acquaintances at any time.

CUT THIS OUT—PIN IT IN YOUR HAT
CLEVELAND CONVENTION REMINDER

CLEVELAND CONVENTION DATES—American Ceramic Society meets Feb. 21-23 at Hotel Statler. National Paving Brick Manufacturers' Association meets Feb. 21-23 at Hotel Statler. National Brick Manufacturers' Association meets Feb. 23-26 at Hotel Statler.

FATE FREE SERVICE HEADQUARTERS—General Reception Rooms, Nos. 343 and 345. Guests Rooms, Nos. 330, 332, 334 and 336.

FATE FREE INFORMATION—For any information about the convention, the city or the manufacture of clay products, stop the first man you see wearing this badge, "Ask Fate" and he will supply you with the answer, or direct you where to get it.

Harley H. Fate

George B. Drennan

"Ask Fate" at Cleveland

H. R. Sykes

H. J. Votaw

G. A. Anderson

THE J. D. FATE COMPANY
Makers of Clay Machinery and Plymouth Locomotives,
Plymouth, Ohio.

Representatives at Cleveland:
H. H. Fate, President.
George B. Drennan, Sec'y. and Treas.
H. R. Sykes, Director of Sales.
H. J. Votaw, Special Representative.
George A. Anderson, Special Representative.

See additional advertisements on pages 246 and 247.

BRICK

MORE AND
BETTER
PER $
SCHURS

Write the
SCHURS
OIL BURNER CO.
LOS ANGELES
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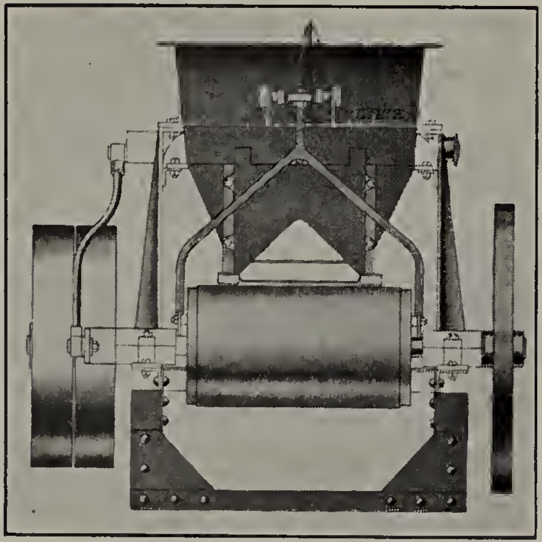
PYROMETERS

BROWN
ELECTRIC PYROMETER
THE BROWN INSTRUMENT CO.
PHILADELPHIA, PA.

Brown Pyrometers will mean more uniform burning of your kilns, less fuel consumption, better ware. Why not install them as all progressive concerns are doing?

Brown Instrument Co.
Philadelphia, Pa.
New York Pittsburgh Chicago

The Schaffer Poidometer
PATENTED



The Poidometers automatically temper the clay. They unite any number of materials in correct proportions. They weigh the materials, measure the water and deliver them in a predetermined quantity per minute in an even, constant flow.

They cause a uniform column of clay to flow from the brick machine at a regular speed.

INVESTIGATE AND
INVEST IN THESE MACHINES.
IT WILL PAY YOU.

The Schaffer Engineering & Equipment Co.
Tiffin, Ohio

THE CERAMIST'S CORNER.

(Continued from page 164.)

the nature of the clay. The writer has found that attempts to increase the temperature too rapidly at this period, requires an excessive amount of cleaning of fires and this is likely to result in fire cracking and crazing, especially during the early stages of vitrification. In the latter stages too rapid heat increase will not permit uniform distribution throughout the ware in the kiln. In raising of the heat too fast, the necessary amount of air is not admitted for proper vitrification. Close firing results in reducing conditions, the heat remaining in the top part and burning the top pipe and outside ring of pipe too hard and causes the filling or stuffing, that is, small pipe inside of larger pipe are too soft. When glazing the ware in this condition, the top pipe may be very nice while the pipe one or two high from the bottom and the stuffing are unglazed. By taking a reasonable amount of time in making the heat, allowing air to pass in over the fires and gradually reducing the draft, the heat will be conveyed from the fireboxes and top of kiln to the middle, sides and bottom. By regulating the draft and leaving fires open, a soaking process is obtained, which is the holding of the temperature about uniform and distributing the heat uniformly throughout. The soaking process should begin as soon as the temperature and vitrification of the top pipes is sufficient for glazing; and then by the manipulation of drafts and fires, the temperature is held constant. No large amount of heat dare be lost during the soaking period, for if the heat is lost, it is very difficult to regain it. When the soaking process is on, the draft is reduced to check the inrush of cold air, and by giving close attention to fires while the air is going in over them, the temperature can be held constant, and the heat conveyed from the fires to the bottom ware. By repeating the firing and checking of the draft, the heat can be brought to the bottom or floor of any kiln.

There are three common means of determining the temperature or degree of vitrification necessary for proper glazing: trials, cones, and pyrometer. The trials made from the clay can be used alone. The cones may be used alone, although they are sometimes greatly affected by the gases in the kiln, causing variation in their melting points. The pyrometer is very convenient and of great help in raising the temperature, but when the finishing time nears, and the time elements must be considered, the pyrometer only can give us the maximum temperature. The trials, cones and pyrometer used together serve as a check on each other; and too much care can not be taken, for the temperature or degree of vitrification must be right to obtain proper results. The cones and trials should be placed in the same place every time, near the door, so that trials can be easily removed. It is good practice to use two sets of trials and cones, one set about two feet from floor and the other about four feet from floor and both about five feet from door. With two sets, the distribution of heat can be checked with a greater degree of accuracy. The common practice is to raise the heat to that stage at which, when the trials are drawn and broken while hot, they show a glassy fracture. The clay is then very near the danger line and in a majority of cases has reached proper vitrification for glazing. The writer does not want to mislead any one by this statement. However, in the clays which he has handled, this is a very good degree of vitrification for glazing, and with slight variation ought to prove correct for most clays from which sewer pipe are manufactured.

Glazing. The glazing of sewer pipe is not a difficult proposition, if the ware and kiln are in proper shape for glazing. It is only necessary to observe the different colors and sometimes the roughness of ware that are found at one plant, to realize the different conditions of the kiln, gases and ware that must exist to produce these varied results. Starting with the ware at the proper degree of vitrification, clean fires and good draft, the salt is thrown upon the hottest part of the fire, so that it will volatilize rapidly. The controlling of fire and draft are the vital points in securing a good glaze and smooth ware. Great care must be taken to produce "just right" conditions, as the "extremes" are dangerous. With too much draft, giving oxidizing conditions, the glaze will be very light, and it is generally difficult to maintain sufficient heat to burn the salt properly. On the other hand, not enough draft produces reduction, and if the clay contains particles of iron, with reduction these will fuse, causing very rough ware. The medium of the two is what produces the fine glazed ware, and the other two, the off colors, light glazes, etc. The amount of salt and number of rounds will vary, although it seems that five or six applications ought to be enough for any clay. If it is not, I would say that the proper degree of vitrification was not obtained, though, of course, there are many reasons to cause the amount to vary considerably. The volatilizing of the salt requires a large amount of heat, and it is very seldom that the temperature increases during the salting, so that the proper vitrification ought to be obtained before starting the glazing. If the temperature shows any marked increase, the firing can be let up a little to check increase of temperature. The writer has seen kilns which have been salted from four to twenty times; and in all cases where the heat was good and proper degree of vitrification had been obtained, the kilns salted four times were as good as the ones receiving the salt twenty times.

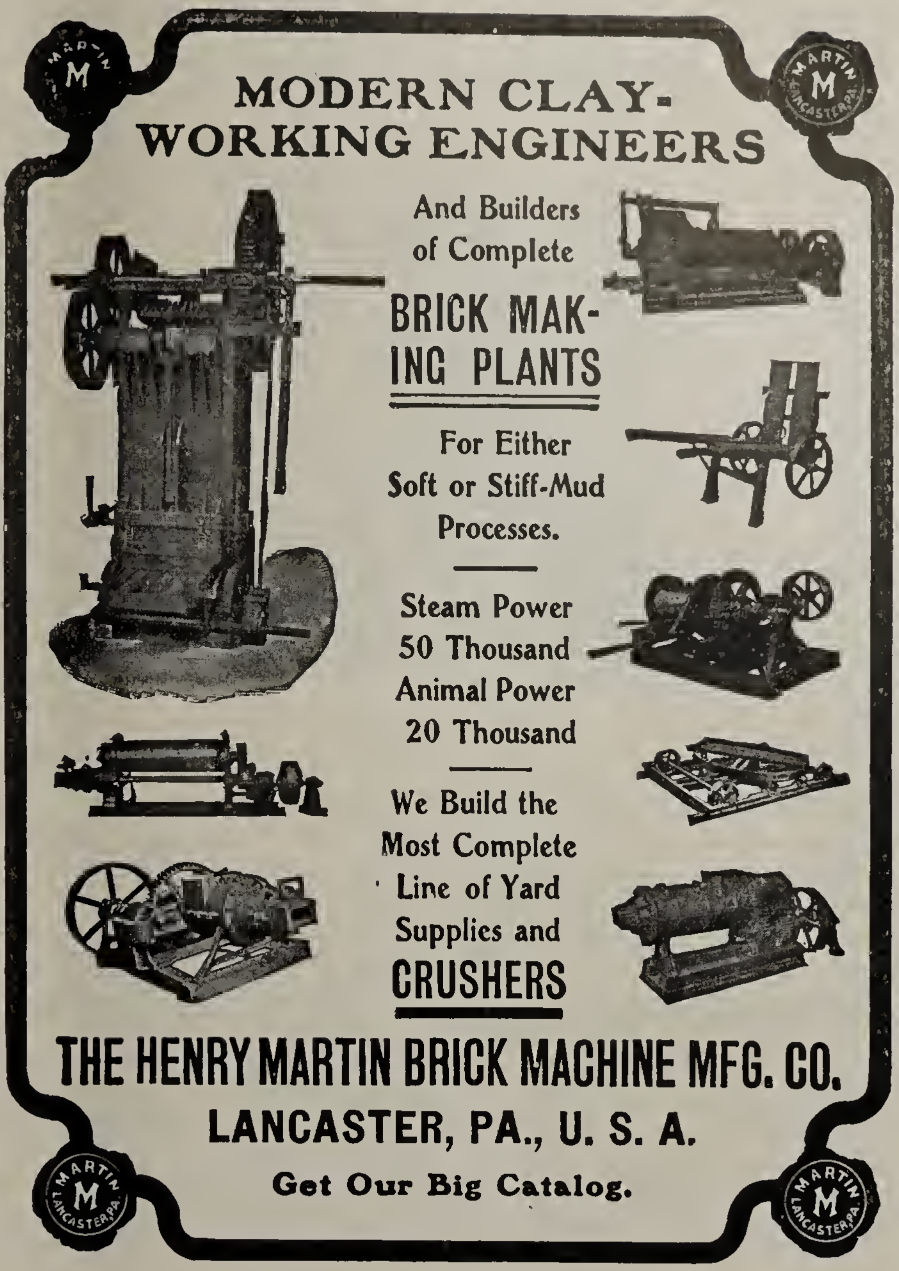
The cooling of sewer pipes will not be touched, as the writer heartily supports the methods of cooling given in Volume XVI of the "Transactions of the American Ceramic Society."

The construction or arrangement of the kiln exerts a very marked influence upon the burning and glazing of sewer pipe. There are so many different kiln bottoms that they will not be discussed in this paper.

CURRENT TRADE LITERATURE.

The Book of Smiles for February is an exceptionally interesting number replete with odd philosophic comment and humor. For instance, "The world is full of forces which the energetic chap is constantly and carefully endeavoring to tap; and when it coldly tells him that it never heard of him, he simply advertises with persistency and vim, until he penetrates its outer surface tough and hard, and ultimately gathers in a suitable reward." In a lighter vein are a number of interesting paragraphs, such as, "There are two periods in a man's life when he doesn't understand a woman. The two periods are before and after marriage." An ornate drawing of the subject of this paragraph illustrates the mystery of womankind as the artist sees her. Seriously, the book tells of the merits of the Standard Dry Kiln and invites those who will be in attendance at the N. B. M. A. convention at Cleveland to meet their representatives, the S. D. men, at the Statler. The unfortunates who will not be there may lessen their measure of woe somewhat by getting a copy of the Book of Smiles. It can be had on request to the Standard Dry Kiln Co., Indianapolis.

The Los Angeles Pressed Brick Company has favored us with their price list of sewer pipe and other clay products. It is a handsomely printed book of twenty-eight pages. Among the illustrations is a fine view of their plant number 2 at Santa Monica, Cal. The price list on sewer pipe is very complete; all forms of pipe are illustrated, as are also their grease traps, flue linings, etc. It also illustrates the Frost patent radial interlocking brick for sewer purposes, and shows a test which developed a crushing strength of something like 20,000 pounds. These radial brick can also be used to decided advantage in the construction on manholes. A copy can be had for the asking.



MODERN CLAY-WORKING ENGINEERS

And Builders of Complete
BRICK MAKING PLANTS
For Either Soft or Stiff-Mud Processes.

Steam Power 50 Thousand
Animal Power 20 Thousand

We Build the Most Complete Line of Yard Supplies and
CRUSHERS

THE HENRY MARTIN BRICK MACHINE MFG. CO.
LANCASTER, PA., U. S. A.
Get Our Big Catalog.

IRON & STEEL

KILN BANDS,
Rails,
Steel Plates, Bars,
Reinforcing Bars,
Shafting, Bolts,
Lugs, etc.
Forges, Blowers,
Blacksmith Supplies.

W. J. Holliday & Co.
Indianapolis, Ind.

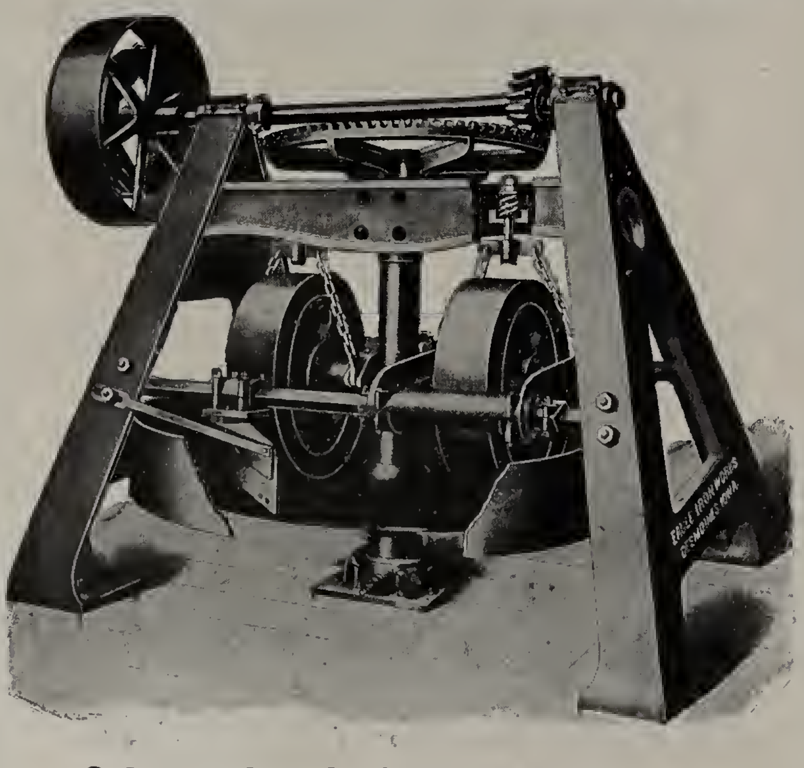
AT THE CONVENTION
CALL ON

C. B. THWING
at Room 344
and let him demonstrate the workings of

THWING HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

He will have a lot of friends at the Convention who will back up his claims by telling you how they have saved money using Thwing Pyrometers.

Independent and Suspended Mullers
the distinguishing feature of our **DRY PANS**



Other valuable features which our catalogue fully describes.

EAGLE IRON WORKS
Des Moines, Iowa

Written for THE CLAY-WORKER.

AMONG PHILADELPHIA BRICKMAKERS.

PHILADELPHIA BUILDING brick industry at this time presents one of the most promising pictures to have been viewed by the manufacturers of this district for some few years past. With the building brick and tile manufacturers existing business conditions are good and indications for a banner season for this branch of the brickmaking industry during 1916 are strong.

In a majority of instances the Quaker City building brickmakers and distributors have more actual business on their books now than at this same time of any of the past three years, while inquiries on still other new business are being received in goodly numbers in quick succession. As the result of such a healthy state of afiairs, practically all the Philadelphia and nearby plants are being opearted to a heavy seasonable capacity and the local brick manufacturers are most optimistic and confident in their anticipations of what the coming few months will prove conducive of in the way of business. Prices have stiffened somewhat on building brick of various kinds and the general situation here is roseate.

A splendid survey of current conditions and prospects for this year, so far as they will affect the vitrified brick industry of this city and vicinity, was made at the local offices of the McAvoy Vitrified Brick Company, by John C. McAvoy, secretary and manager of this enterprise. Mr. McAvoy, in part, said: "The future as it presents itself to the vitrified brick manufacturer and industry of Philadelphia today, is one of the brightest with which we have been confronted for a long time. This is due directly to two of many changes which have taken place in Philadelphia within the past few months and which assure to the vitrified brick trade a healthy and increased amount of business for some little time distant, at least. One of these changes to which I refer is the generally improved conditions of business throughout Pennsylvania and adjoining states, and the recent election of Thomas B. Smith to the office of mayor of Philadelphia. For the local industry, perhaps the election of Mr. Smith is the more important. Mayor Smith is a man of progressive municipal ideas and one who knows the actual needs of this city. Under his administration many needed repairs will be made to sewers, streets, etc., and other city systems will be extended which two things will result in considerable business, while it is almost a certainty that about double the amount of needed work along these lines that was done during the preceding four years, will be done during the coming four years, comprising Mayor Smith's term of office. This work may not open up for a little while yet, as it will take the mayor and councils some time to get their plans in definite shape, but it will eventually come and we are thoroughly optimistic with regards the future. At present our plant is working to a good capacity and we have considerably more business on hand now than we have had to open any season of either of the past two years."

Through a recent court decision, a verdict formerly awarded Williard D. Stayman giving him a claim of $315.59 against the Hamburg Vitrified Brick Company, of Twentieth and Sedgley avenue, this city, is sustained. Stayman was formerly employed by the company as a foreman at the Hamburg, Pa., plant, under a one-year contract. He was discharged by the firm prior to the expiration of the agreement and could only secure a less remunerative position, so he brought suit to get the difference in salary, claiming that he was discharged unwarrantedly.

Among other Philadelphia brick manufacturers now enjoying a prosperous business is the Equitable Brick Manufacturing Company. Things with this firm are reported as steadily improving and their newly erected up-state plant is now in fine running order for the anticipated busy spring and summer periods.

The firm of Hyzer & Lewellen, fire brick manufacturers, of 952 North Ninth street, this city, have introduced additional safety devices at their plant to safeguard the lives of their employes. Several days ago one of the workmen, Ernest G. Henry, was caught in the machinery in the plant's power house and killed. J. W. Lewellen, proprietor of the works, has had a stockade erected about the engine with a locked gate so that it is now inaccessible to anybody except the engineer.

Business conditions now current with the Reading Shale Brick Company, of Reading, Pa., are brisk and from present indications the firm is entering upon what is expected to prove a banner year's business. Eight of their down draft kilns are in operation and a force of forty-five men are employed in the present operation of the works. During 1915, the company averaged a total output of 10,000,000 bricks. It is intended to increase the plant's output capacity and to improve the production by the installation of some new machinery.

Announcement was recently made from Harrisburg, Pa., that the state workmen's compensation board had, among some fifty-six other companies, exempted the Harbison Walker Refractories Company, of Pittsburgh, from the necessity of insuring their compensation liability. This action came as the result of the company's having satisfied the board of its financial ability to meet claims which might arise.

The recent campaign conducted by the members and associate members of the Philadelphia Master Builders' Exchange, in which organization local building brick manufacturers are directly interested, to increase the membership of that coalition, received the hearty co-operation of many members of the local industry. It was the intention to increase the old membership by 1,000 but the campaingn was successful away in advance of the goal set. At the recent annual meeting of the exchange, the following were olected officers to serve during the ensuing year: George J. Watson, president, reelected; Jacob L. Tyson, first vice president; O. W. Ketcham, second vice president; Edwin E. Hollenbach, third vice president; Frank H. Reeves, treasurer, and Charles E. Smith, secretary and general superintendent. A. QUAKER.

GOVERNMENT AID IN SELLING.

The various departments of the government naturally give aid to developing technical features of various structural materials and the establishing of standards and in a way these are indirect aids to the marketing of various products. However, in the case of lumber, the forest products laboratory of Madison, Wis., seems to be rendering aid that has direct connection with the selling end of the business.

At a recent meeting of the trade extension department of the National Lumber Manufacturers' Association reports of the secretary of this department stated that co-operation had been arranged with the forest products laboratory at Madison, Wis., for the building of a number of small models to show various interesting uses of wood. At the same time it was reported that arrangements were being made for installing a permanent display of lumber and wood in the building material exhibit in the Insurance Exchange Building, Chicago, to be in position not later than May 1.

The particularly interesting feature of this is in the assistance being rendered by a branch of the forest service in preparation of models to show the many different uses of wood. These are as much aids to salesmanship as they are demonstrations of various lines of utility for wood products.

The question this naturally raises is, have we as much of this kind of co-operative effort as could be used advantageously between the geological survey and the bureau of standards and the clayworking industry. We know that the clayworking industry has received much valuable assistance from these departments especially in research work and in the establishing of standards of product and methods of manufacture. The question in mind now is whether or not there is room to extend this co-operative effort and make it take in more of the nature of teaching the various possible uses of clay products to the end that the volume of consumption may be increased.

Have You Tried Gandy Belting?

You have been reading about it for 37 years—provided you have been using belting for that length of time. And during all these years sales of

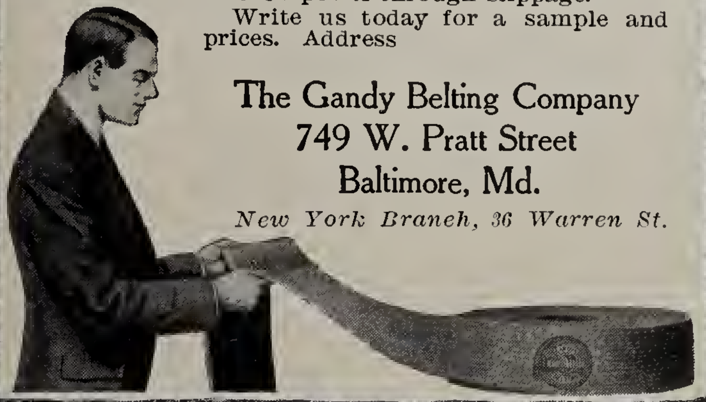
GANDY
Stitched Cotton Duck Belting

have increased constantly, so you can feel positive that GANDY is a good sound belting proposition, giving thousands of concerns satisfactory service for *less money* than they can get with any other.

Have you tried it yet? If not, investigate its possibilities now. It is water, oil and dust proof; made by a patented method that prevents stretching, and has a tenacious hold on the pulleys that prevents loss of power through slippage.

Write us today for a sample and prices. Address

The Gandy Belting Company
749 W. Pratt Street
Baltimore, Md.
New York Branch, 36 Warren St.



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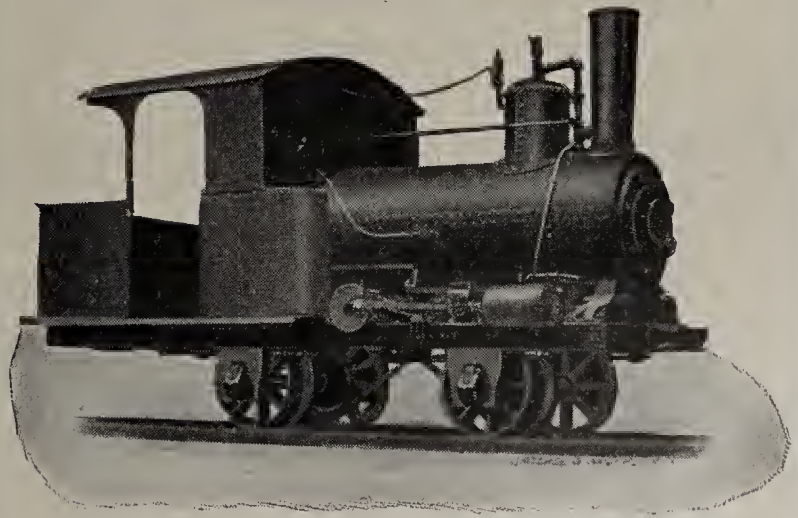
INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

Mr. Brickmaker, Everywhere:

Concrete was established in this country through advertising and publicity. Every manufacturer and dealer in lumber, sheet metal, stucco and composition material advertises all the time. The advertisements calling the attention to the possibilities of common brick are as scarce as the proverbial hen's teeth. Are you in business to supply the man who will not have anything else, only. Why not get after the fellow who is using some other material because he don't know you are on earth?

Advertise your products, and use *Carbide Coating* to reduce drying and burning expense.

I will be glad to tell you how you can use Carbide Coating to advantage; it is being done.

E. R. STOWELL,
Oden, Mich.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

BUILDING AND PAVING in Kansas City and this territory have been increasing nicely during the last part of winter and the increase is expected to continue until winter again sets in. The brick companies with offices in Kansas City have been reporting that their plants are working nearly to capacity filling the orders and the store yards with brick for the coming season. Indeed, there is every prospect that the season will be early this year and that the year will see the brick business doubled over that of last. A great deal of the attention of the paving brick men is now turned toward the coming election. The election of certain parties to office means the paving of many square miles of city and county roads with brick. The reason for this is the fact that most all of the contractors are looking forward to the election of a new mayor and the selling of the bonds that were voted at the last election but which the mayor now in office has successfully held up. Most all the candidates for office are promising the immediate sale of these bonds that were voted at the last election.

In the Country Club district of Kansas City, the finest residence district, the construction companies have been busy developing and building residences. Over ninety per cent. of these are being built of brick with tile roofing. The J. C. Nichols company has been the pioneers in this district and are doing the largest building in this line, using brick in the houses almost exclusively.

The cities of the state of Kansas have been asking for bids on the paving of many streets and the business in that section of the country is almost double that done during the same period a year ago. The plants of the various companies in Kansas are working steadily in producing the brick necessary for the amount of paving that contracts have already been let for.

Roy Smith, Kansas City manager of the Bonnot Company, manufacturers of clayworking machinery of Canton, Ohio, says that the business done by his company is increasing rapidly and that the outlook for the present year is much better than it has ever been before.

The plant of the Pittsburg Paving Brick Company, at Pittsburg, Kas., has been working almost to capacity during the past month. Under the direction of Mr. Nesch the plant is rapidly becoming more modern. Plans have been made making it possible for the company to double the output this year without in any manner crimping the facilities of the plant. Natural gas is used for burning.

The Kansas Buff Brick Company has been enjoying almost exceptional fine winter business. The company has been mighty fortunate in landing several of the largest contracts to be let during the winter months.

Arthur Killick, better known by the name of "Fatty Lewis," and the author of "Fatty Lewis' Stories," has taken a position with the Walter S. Dickey Clay Manufacturing Company. Mr. Killick has been making something of a success of the lecture platform since the invention of his new school game, known as the "Sunshine Bank," which has been successfully established in the schools in this locality. Mr. Killick will take up publicity and lecture work for the Walter S. Dickey company and his vast newspaper experience will doubtless prove a big asset to him in this work.

The Hydraulic Press Brick Company has been furnishing a great many brick for the winter construction that has been going on in Kansas City. The company has been furnishing the Hy-tex brick for the Bales Baptist Church which is now under construction and which will require several thousand brick.

J. L. Davies, F. Lemon and I. B. McCombs filed a petition against the National Ornamental Terra Cotta Company of Kansas City. In the petition the men allege that the National Ornamental Terra Cotta Company owes them respectively $1,050, $6.39 and $35.90. Harry Stiver, president of the National Ornamental Terra Cotta Company; C. W. Smith, secretary and treasurer, and A. F. Brooker, manager, in their answer to the petition, allege that they are not indebted to the three men named in the petition nor have they ever been and that thy have not committed any acts of bankruptcy in preferring certain creditors over others.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

JANUARY brought a succession of storms of unusual severity, which continued well into February, and extended all over the Pacific Coast and mountain states. In many localities (though not to any great extent around San Francisco) serious damage resulted from floods, heavy snow and high winds; and building has been practically at a standstill all over this section. The result is that the few brick, terra cotta and sewer pipe plants that are in operation are running on a reduced schedule. This condition, however, is not expected to last much longer, as architects and engineers are exceptionally busy, and figures have gone in on a great many business and industrial buildings in this vicinity, on which work will be started just as soon as weather conditions permit. The current demand for sewer pipe is light, but in this line also plans are under way which will require a great deal of material.

F. A. Costello, president of the California Pottery Company, is also at the head of the California Paving Brick Company, which was organized a few months ago. Experiments are being conducted at the pottery company's sewer pipe kilns on Twenty-third avenue, Oakland, in making paving blocks from a shale found in Calaveras county.

Gladding, McBean & Co., one of the largest terra cotta and pressed brick firms in the state, have moved their San Francisco offices from the third to the top floor of the Crocker building, Market and Post streets. They have the corner space, taking up most of the floor, and have fitted the quarters up in fine style. The entrance is ornamented with a large terra cotta bench, and several beautiful jardinieres, and several similar articles are used for decoration in the main office, while the walls and pillars are decorated with other samples and photographs of their best work. Things have been rather quiet at the plant at Lincoln, Cal., for some time, but the work now coming in promises a busy season in the spring. Athol McBean of this company has just returned from the North.

The Stockton Fire and Enamel Brick Company has moved its San Francisco office from the old California Safe Deposit and Trust building to the Rialto building, where much more comfortable quarters have been secured.

The Steiger Terra Cotta and Pottery Company reports business in all departments picking up again, after a rather quiet month, sales of fire brick being especially good. Deliveries of terra cotta are now being made for the Redding school in this city.

N. Clark & Sons report a nice lot of small terra cotta contracts in the last few weeks, besides inquiries for more important work. They are now making deliveries on the Alameda county infirmary, and have a number of sewer pipe orders, delivery of which is delayed by the wet condition of the ground. They have completed some further improvements to their local sample room, which is probably the handsomest clay products exhibit in the state.

The Valley Brick and Tile Company plans to start a plant near Modesto, Cal., with W. M. Anderson in charge.

Plans are about ready for the $70,000 plant to be built at Astoria, Ore., by the Warrenton Clay Company, headed by George W. Warren. Sewer and conduit pipe will compose most of the output.

The Remillard Brick Company, which operates several plants around San Francisco Bay, has just built a neat little office building for the use of its yard clerk, at First and Clay streets, Oakland, where the brick is landed for the Oakland trade. The building is of brick, and besides being useful and ornamental is a good advertisement of the business.

The Diamond Brick Company, Balboa building, San Francisco, represented by C. B. Ashcroft, is handing out attractive business cards which are a fine boost for brick. The face bears a cut of a handsome brick home, with suitable comment inthe margins ;and the back is filled with reasons for building with brick. Mr. Ashcroft says the plant at Pittsburg, Cal., is operating in a small way through the wet weather, but he looks for an active season, as the company's line of wire-cut face brick in many colors is taking the place of more expensive pressed brick to a large extent. A Brown electric pyrometer is now being installed at the plant.

San Francisco, February 4. SUNSET.

Opportunity to Economize!

From cat to king, we are all on the "still hunt" for "opportunity!" Every day you are searching out business economies. Daily do you make certain decisions which you believe will affect the more economical operation of your plant.

Opportunity Is Now Beating a Tattoo On Your Door!

The Hook System of burning will save fuel, time and labor. This statement—although strong—is just as easy to prove as it is to say! You can improve the quality of your ware with our system—and increase the capacity of your kilns—by turning them more often.

Old kilns can be converted to the Hook System at comparatively small expense and new kilns built at less cost, as a rule, than kilns of other types.

We can furnish plans for remodeling old or building new kilns, or where desired, send competent masons.

Write for Information

HOOK PATENT KILN COMPANY
Main Office, Vigo, Ohio
Canadian Office, 250 Dufferin Street, Toronto, Ont., Can.

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ORIGINAL BOSS SYSTEM

BOSS
Ten-Hour Unit-Control Dryer

Dries in ten hours.
No live steam.
All heat from exhaust steam [or waste heat.
No cracked brick.
No whitewash.
No clay too tender.

BOSS
System of Burning Brick

Uses SLACK coal exclusively.
ONE-HALF less fuel cost.
LESS TIME. Better brick.
Burns paving block,
fire-flashed face brick,
common builders and hollow ware.

Catalogs on request.

John C. Boss Company, 405 Monger Bldg., Elkhart, Indiana

WEBB WIRES WEAR WELL

WRAPPED
TWISTED
SOLDERED

Combining all the best of looped wires with the Red Label features of other makes superior quality of our Piano Wire.

The WEBB WIRE WORKS, New Brunswick, N. J.

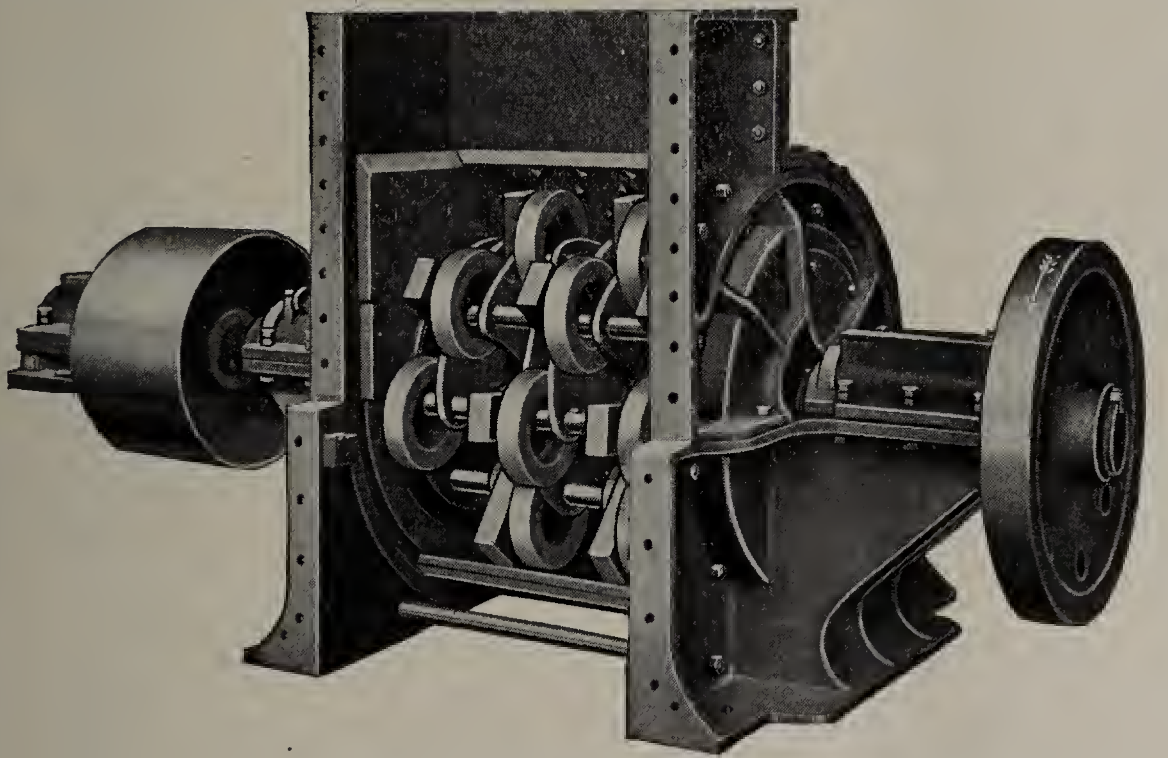
BROCADE BRICK

Manufacturers, Dealers, Architects and Builders are invited to inspect a large display of this up-to-date material at the Complete Building Show at Cleveland, Ohio, February 16th to 26th. Browns, Greens and mingled shades will be shown.

Design, Method of Manufacture, as well as the Machine for Producing this brick are covered by United States patents.

The Kansas Buff Brick & Mfg. Co.

BUFFVILLE, KANSAS



IMPROVED MODEL

Disc removed from the grinding room of the machine and installed in offsets in housing sides.

Inner housing sides lined with 1¼-inch thick chilled iron liners.

Rings and hammers overlap, thereby total grinding surface utilized.

UPKEEP DECREASED

CAPACITY INCREASED

The Decatur Brick Manufacturing Company, Decatur Ill., installed our largest Pulverizer, season 1913. We are now building them another of like size. Merit has won against all competitors.

Buy the best. You will win. Catalog on request. Describe your material. State tonnage and screen mesh fineness.

AMERICAN PULVERIZER CO., East St. Louis, Ill.

CONVENTION OF ILLINOIS CLAYWORKERS' ASSOCIATION.

(Continued from page 173.)

The play put on during the smoker taught a lesson to the average brickmaker. It dealt with cut prices and showed how a lying contractor can make the average brickmaker cut prices to suit his fancy, leaving the manufacturer the bag to hold while the contractor gets all the rake-off, even when the consumer has absolutely specified the brick at a definite cost, which allows a good profit to the producer. Much humor was scattered through the several scenes of the play with cracks at llinois clayworkers that created a great deal of laughter. Mr. Huckins played the leading part and was surrounded by an able company, a student from the Illinois university portraying the lady who was building the brick home. Messrs. DeWolfe and Kay, of the geological survey, acted well the parts of second brickman and architect, respectively, as did Mr. Radcliffe who got the reduced prices.

There were also cabaret stunts before and after the play with clay pipes and good cigars in plenty.

Wednesday morning two splendid papers were read i. e. "Coal Measure Shale," by F. W. DeWolfe, Urbana, and "Facts Developed By Clay Tests," by A. E. Williams, Urbana, after which the delegates adjourned to the Columbia theater where a moving picture film of the Gem City Press Brick Company, Quincy, Ill., was shown followed by stereopticon views of the ceramic department at Illinois university. Mr. R. K. Hursh was the lecturer. After the show the delegates returned to the convention hall where Mr. Hursh continued his talk on "Developments of Department of Ceramic Engineering," University of Illinois.

The Wednesday afternoon program was one of the best of the convention. It was during this session that Dr. G. C. Mars, of the Hydraulic Press Brick Company, St. Louis, delivered a splendid informal talk on the subject "Does It Pay to Advertise." An interesting talk by H. T. Scoville on "Cost Accounting," was followed by a long discussion. After this Mr. D. C. Haeger read a valuable paper on "Our Profits." Nearly every angle concerning freight rates was discussed after Mr. Pretorious' speech on that subject.

Wednesday evening the delegates enjoyed a well prepared banquet. Mr. W. D. Gates was toastmaster while the speakers were Dr. G. C. Mars, J. T. Buckley and W. B. McIntyre. The writer has never listened to three finer speeches than the ones these gentlemen delivered.

Thursday morning a business session was held wherein reports of the several committees were made and accepted, succeeded by the election of officers as follows: President, J. L. Buckley, Aledo; vice president, B. H. Richards, Jr., Edwardsville; secretary, A. E. Huckins, Urbana, and treasurer, G. C. Kanne, Peoria.

The convention then adjourned, the delegates forming in separate sections, namely: Common brick, face brick, hollow-ware and drain tile, where the individual problems and difficulties were thrashed out. This is a new departure which will, no doubt, prove of exceptional value to the members.

While nothing definite was decided as to the next meeting place, it is practically understood that Champaign will secure the convention.

PACIFIC NORTHWEST CLAY NOTES.

THE HOPE THAT building operations would soon open up in the Pacific Northwest has been deluged by the severe weather conditions in this section. It is claimed the worst in twenty-six years, and the end is not in sight yet. All trains have been stalled in the mountains for five days, and business is practically at a standstill.

Contractors are figuring, however, somewhat more than last month, and some large contracts have been let for spring operations. The Denny-Renton Clay and Coal Company secured a $20,000 architectural terra cotta contract for the $300,000 Arctic building, which will be erected this spring in Seattle.

The Pacific Face Brick Company, Portland, is making an effort to have its white brick specified for the Roseburg (Ore.) postoffice, although the present specifications call for a red press brick, and it is claimed no red press brick are made in Oregon.

The American Fire Brick Company, of Spokane, closed a contract with the new sawmill of Shevlin-Hixon Company in Bend, Ore., for all the fire brick for its boilers.

Mr. Warren Overpack, who has promoted several sewer pipe and clay companies in the East, has incorporated the Warrenton Clay Company, and contemplates the erection of a six-kiln plant at Warrenton, Ore., near Astoria. The clay in that district is especially adapted for the making of sewer pipe, hollow tile, glazed conduit, flue lining and kindred products. The plant will be located on a fifteen-acre site donated by the Warren estate on the Skipanon river. Mr. George W. Warren is president; Mr. E. P. Smiley, secretary and treasurer, and Mr. Overpack is general manager. The Geijsbeek Engineering Company, of Portland, is making the plans for the new plant and will look after the erection.

The Denison Interlocking Tile Company has been incorporated in Portland by John C. Stanton, J. B. Currie and William D. Bennett. They will control the Denison block business for the state of Oregon.

The Denny-Renton Clay and Coal Company, of Seattle, has opened up an office in Tacoma, Wash., at Fifteenth and Dock streets. H. J. Crowe, formerly the sales manager at its head office, has been made resident manager.

The Harper-Hill Brick Company, of Seattle, which has for years maintained an office at the Seattle water front, has moved to the Central building. Mr. W. C. Morse is now in charge of the office.

The Unique Brick and Tile Company, of Portland, which has a plant four miles east of Gresham, has reorganized, with Milo C. King, president; Al Bingham, vice-president, and Ed. Gurney, secretary and treasurer. SIWASH.

HUDSON RIVER BRICK PLANT INSTALLING DRYER.

The Terry Bros. Company, one of the oldest and largest brick manufacturers in the Hudson River district, having been established in 1850, is now modernizing one of its plants at Kingston, N. Y., by installing a steam dryer with a daily drying capacity of 100,000 brick. The Standard dryer, made at Indianapolis, by the Standard Dry Kiln Company, was quite naturally the one selected by the Terry Bros. Company, as this dryer it seems is almost universally sued by the eastern New York brickmakers.

GANDY BELTING ESPECIALLY ADAPTED FOR CLAY PLANTS.

In their advertisement on page 209 of this issue, the Gandy Belting Company makes mention of the fact that Gandy Belting is water, oil and dust proof. They might have also added that Gandy Belting is made by a patented method that prevents surplus stretch and gives it a tenacious hold on the pulleys that prevents loss of power through slippage. Gandy Belting is superior in many ways and is peculiarly adapted to use in driving clay machinery. Other interesting information will be furnished on application to the Gandy Belting Company, 749 West Pratt street, Baltimore, Md.

A LESSON IN STREET PAVING.

An o'er true tale and one that it seems must be repeated time and time again is told by the Alliance Review of recent date is an account of the failure of tarvia pavement in that thriving Ohio city, and as a result the taxpayers are "holding the bag," so to speak. Against the judgment of many of the citizens South Union avenue was surfaced with a tarvia pavement. Now, though the winter has been a mild one, the pavement is crumbling and the tarvia is being powdered. The Review states that a ride in an automobile over this street will convince any one that the pavement has been an expensive luxury. It was put down under a three-year guarantee, so that the pavement may be kept in fair repair for another year or two, but after that it will have to be resurfaced, and again at the expense of the taxpayer. How much better it would have been had the street been paved with brick in the first place.

Classified Advertisements

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

FOR SALE.

Bonnot Brick Machine, cut off, pug mill and repress. First class condition. Address

BOX 133,
2 6 d Danville, Ill.

FOR SALE CHEAP.

Five thousand 10 by 34 steel pallets in good condition. Address

HAMPTON,
2 1 c Care Clay-Worker.

FOR SALE.

Brick and tile plant. Excellent shale. Three kilns. Will sell for half original cost. Address,

SHALE BRICK & TILE CO.,
9 6 cm Winterset, Iowa.

FOR SALE.

Fully equipped 30,000 daily capacity red brick plant of Tobias & Sheradin. Dwelling house and barn on premises. Good shipping facilities. For particulars address

TOBIAS & SHERADIN,
2 3 cm Hamburg, Pa.

FOR SALE.

One of the best brick plants in southern Wisconsin. Annual capacity, three million. No trouble or expense to sell entire output, as we have a good market for all we can make. Would consider renting to suitable party on per thousand basis and give option on plant. It will pay you to investigate this proposition.

SCHALLER-YOUNG LUMBER CO.,
2 3 cm Edgerton, Wis.

FOR SALE.

One type "O" Thew automatic shovel, shop number 687, bought February, 1912. Only used to dig about 18,000 yards of clay. In splendid second hand condition. Price, $2,500.00 F. O. B. cars Memphis, Tenn.

Also six Quincy clay gatherers in fair condition, $250.00 each F. O. B. cars, Memphis, Tenn.

One Buffalo gasoline engine type J. J. 25 h.p., nearly new, used about one month. Price, $400.00 F. O. B., Memphis, Tenn.

One slide valve engine in good repair, 14 by 22 inches, 11-foot flywheel. $300.00 F. O. B. Memphis, Tenn.

SOUTH MEMPHIS BRICK CO.,
2 tf d Memphis, Tenn.

FOR SALE.

Cheap, a practically new model "JA" Freese brick machine, and "C-40" cutter. Run less than 3 months. One American Clay Machinery Co.'s repress No. 292, used less than 30 days.

Address BOX 2—N. Y.,
2 2 d Care Clay-Worker.

FOR SALE OR LEASE.

Brick and tile plant in good running order. Capacity, 30,000 brick. Good machinery, large Corliss engine, nearly new. Four kilns, 30 acres shale deposit. Good shipping location. An exceptionally good opportunity. Address,

BOX 2—W. G. M.,
2 1 d Care The Clay-Worker.

FOR SALE.

1 50 h. p. Atlas single valve throttling heavy duty engine.

1 60 h. p. Atlas horizontal tubular boiler.

1 60 h. p. hot water heater, all in good condition. For further particulars address,

JACOB MAES,
2703 Meramec St.,
12 3 cm St. Louis, Mo.

FOR SALE.

Marion, 100-ton shovel. Marion model 60 shovel; two Thew traction shovels. Dump cars, 1-4-5-12 yard sizes. Locomotives, standards and 36-inch gauge traction engines. Road rollers. Rock crushers. Drag lines. 600-ton relaying rail.

JOHN A. DONAHUE & CO.,
Great Northern Bldg.,
2 1 dm Chicago, Ill.

BRICKMAKERS—ATTENTION!

Have excellent shale in Oregon for paving brick, building brick, drain tile or roofing tile. Coal on property. Another location within 65 miles of San Francisco. Fine shale for paving brick and other clay products. Also plant in operation at San Diego for paving brick, fire-proofing, etc. Address

G. C. STOLL,
211 Higgins Bldg.,
1 2 d Los Angeles, Cal.

FOR SALE.

50 feet of Matthews Gravity Carrier.

80 Rack cars, 12 pallet slides high.

45 Rack cars, 9 pallet slides high, both Ohio Ceramic Co.'s make.

1 Arnold Creager SSS horizontal iron soft mud machine, heavy pattern.

2 Richardson double die steam represses.

1 Freese medium size rotating automatic cutter.

1 American large size automatic rotating cutter.

1 Berg 4 mold dry press.

1 Means wood frame dry pan.

70 lbs. Tee rail.

Address

FRANK H. ROBINSON,
1230 Fulton Bldg.,
2 1 d Pittsburg, Pa.

FOR SALE.

C. W. Raymond & Co. Mobile cutter, now in operation. Will be replaced soon with cutter for making Dunn Wire-Cut-Lugs. A bargain if taken at once. Address

BOX 1—IND.,
1 3 d Care Clay-Worker.

STEAM SHOVEL FOR SALE.

26-ton Vulcan, mounted on four traction wheels. Capacity, 500 to 1,500 cu. yds. per day; 1¼-yard dipper. Good as new; immediate shipment.

WICKES BROTHERS,
Claremont & West Side Aves.,
2 3 d Jersey City, N. J.

WANTED, ETC.

WANTED.

To purchase 50 Steel Deck Drier Cars, capacity 500 to 550 standard brick. Address,

2 4 c K, Care The Clay-Worker.

WANTED.

Experienced brick and tile maker to operate or buy interest in a brick and tile plant. Experience required.

BRILLION BRICK & TILE CO.,
2 1 dm Brillion, Wis.

WANTED.

Situation as superintendent or manager by a man who has a thorough practical experience in the manufacture of fire clay goods of all kinds. Address

BOX 2—REFRACTORY,
2 1 d Care Clay-Worker.

WANTED.

Second hand automatic brick cutting table, Simplex, Mueller Bros. latest pattern. Also a Chambers sander, or a J. C. Steele & Sons sander that automatically sands four sides of the clay bar. Give price and condition. Address

BOX 2—N.,
2 1 cm Care Clay-Worker.

WANTED

Superintendent for brick plant. Must be thoroughly efficient in clay-working from clay pit to the finished product. Plant has capacity of 15,000,000 face brick annually; is modern in every particular and favorably located to supply the Eastern market. A good salary to the right man. Address,

BOX 2—RIGHT MAN,
2 1 dm Care The Clay-Worker.

Classified Advertisements—Continued.

WANTED.

Position by competent burner of sewer pipe and paving brick. Address,

BOX 2—John,
2 1 c Care Clay-Worker.

WANTED.

A first-class machinist with some knowledge of electricity for a modern up-to-date common building brick plant in thriving southern city. Good schools, climatic conditions excellent. Opportunity for man not afraid of work. Position steady twelve months through. Give full particulars of past experience with references, and state salary wanted. Only first-class mechanic and engineer who thoroughly understands machinery in every detail, the care and attention of engine, boilers and pumps, generator and electrical equipment need apply. Good salary to right man.

KAHN BRICK CO.,
2 1 c Selma, Ala.

WANTED.

A young man to take an interest in an established brick manufacturing business in the mineral district of Alabama. From $5,000 to $10,000 needed to put in machinery and increase the plant. Address ALA.,
1 3 cm Care Clay-Worker.

OPENING FOR FIRE BRICK MAN.

An interest in a clayworking plant in Indiana is for sale to an experienced man in the manufacture of fire brick. Clays are entirely suitable. For a number of years they have been used for sewer pipe, high-grade white glazed stoneware, vitrified drain tile and Rockingham ware. Particulars will be given to interested parties who can command $2,000 or more capital. Replies should refer to File No. 55,063. M. V. Richards, Ind. and Agr. Commissioner, Room 361 Southern Railway, Washington, D. C., or Chas. S. Chase, Western Agent, Chemical Bldg., St. Louis, Mo. 2 2 dm

WANTED.

Position as superintendent or burner on building brick plant. Am thorough in all branches.

M. C. WILLIAMS,
701 N. Gibson St.,
1 1 c Princeton, Ind.

WANTED.

Position as superintendent of front paving brick or hollow block, practical in running and upkeep of machinery, first-class burner with downdraft or continuous kilns; best of references.

12 3 c A. J., Care Clayworker.

DENNIS SYSTEM OF KILNS AND DRYERS.

(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

Plans for tunnel dryers for either the car system or the Steel Pallet and Lift Car System.

For testimonials and further particulars address,

F. W. DENNIS,
1052 Bermuda St. Norfolk, Va.

FOR SALE OR LEASE.

Plant of the New Anacostia Brick Company in Washington, D. C. Forty acres of clay land. Complete machinery for 60,000 daily output. Thew steam shovel. Steam dryer, kilns, etc., in good condition. Land is ripe for subdivision and worth the price of entire plant. Will sell plant and lease land. Constant, steady growth of this city, the annual appropriation of millions by congress for erection of public buildings and scarcity of brickyards in Washington, make this the cheapest offer in any part of the country today. For terms, etc., apply to

R. A. PYLES,
2 3 cm 2015 Nichols Ave. S. E., Washington, D. C.

The
ROESSLER-HASSLACHER CHEMICAL COMPANY
100 William Street
NEW YORK

As a Preventative of Scums Use

CARBONATE OF BARYTES

R. & H. PRECIPITATED.

Oxide Tin,
Oxide Cobalt,
Red Oxide Iron,
Green Oxide Chrome,
White Oxide Antimony,
Black Oxide Manganese, and
all Chemicals used by the Clay Trades.

Classified Advertisements.

MANGANESE

BEST QUALITY MANGANESE, CAREFULLY AND UNIFORMLY PREPARED FOR BRICKMAKING. WRITE US FOR SAMPLES AND PRICES.

NATIONAL PAINT AND MANGANESE CO.
LYNCHBURG, VA.

MINERS AND GRINDERS.

Pamphlets Suitable for Distribution by Paving Brick Manufacturers

VITRIFIED BRICK THE BEST MATERIAL FOR SURFACING PUBLIC HIGHWAYS, by Herbert S. Casson.

BRICK PAVEMENTS AS AN INVESTMENT, by W. T. Blackburn.

IDEAL ROADWAYS, by T. A. Randall.

TRUTH IN NEW JERSEY CEMENT ROAD WORK.

STANDARD RATTLER TESTS FOR PAVING BRICK.

FACTS ABOUT ASPHALT PAVEMENTS.

Specimen copy of any one of these pamphlets sent on request. Price in lots of 100, $2.00. Will quote you prices on larger quantities.

T. A. RANDALL & CO., Inc.
Indianapolis, Ind.

Try the "Personal Touch" and "Compare the Work"

YOU "set" the Royal to your personal touch just as you "set" a watch correctly.

A little thumbscrew is given a turn one way or the other, and you find the keys answer your own individual finger pressure naturally.

This helps you to write with the Royal with as little thought of mechanical aid as when you use your favorite pen or pencil.

It takes a great deal more than a little thumbscrew to produce this result. It takes the mechanical correctness of the Royal—the exact response, the balance, the poise, of every moving part.

There is the secret of the sturdy durability of the Royal which combines lightness of action with long life.

This is why years from now you will be a friend of the Royal you buy today.

Get the facts. Know the Royal. Telephone or write any Royal branch or agency for a demonstration now.

Price
$100

ROYAL TYPEWRITER CO., Inc.

Royal Typewriter Bldg.
364 Broadway, New York City.

Branches and Agencies the World Over.

"Compare the Work"

WANTED.

Experienced superintendent for sand mold and wire-cut brick plant in Wisconsin. Address

EXCELSIOR BRICK CO.,
Menomonie, Wis.

WANTED.

One 9-foot iron frame dry pan. Address

FRANK H. ROBINSON,
1230 Fulton Bldg.,
Pittsburg, Pa.

WANTED.

Quotations and samples on manganese ore, powdered and pulp, with freight allowed in full to Butler Spur, Bastrop County, Texas. Address

ELGIN STANDARD BRICK CO.,
1 2 d Elgin, Texas.

WANTED.

Position as manager or superintendent of a paving or face brick plant. Preferably in the southwestern section of the country. Can furnish the best of references. Address

Box 10, S. E.,
10 tf d Care Clay-Worker.

WANTED.

Situation as superintendent or manager, by a man thoroughly experienced in manufacture of common, dry press or stiff mud face brick or hollow ware. Rough texture and varigated colors a specialty. Address BOX 2—BARK,
2 1 d Care Clay-Worker.

WANTED.

To sell a half interest in $25,000 fire and face brick plant. Best deposit of clay in the South. Plant now in operation, with well-established business. Party must have experience to take charge. If interested write for full details.

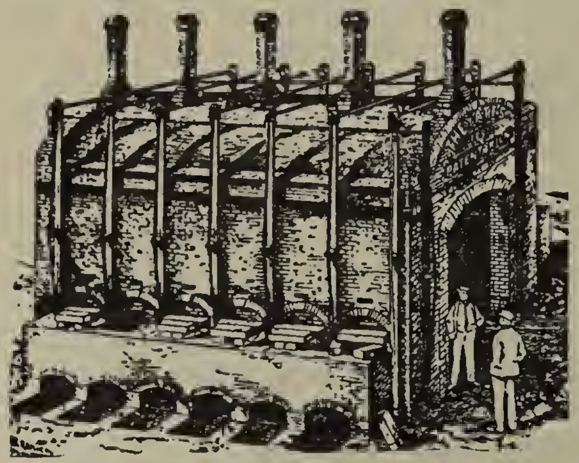
P. O. BOX 664,
1 3 cm Anniston, Ala.

FOR SALE.

Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

T. A. RANDALL & CO.,
Indianapolis, Ind.

E. SCHMATOLLA
Consulting, Designing & Constructing
Engineer and Patent Attorney
To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares
150 Nassau St., New York, U. S. A.



The Yates Patent Down-Draft Kiln Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

ALFRED YATES,
SHAWMUT, PA.

Elevator Buckets

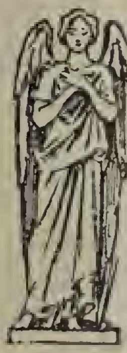
We carry in stock at all times a large supply of Elevator Buckets, including Caldwell Seamless Steel, Regular Riveted and various styles of Malleable Iron.

All sizes and gauges for handling different materials.

Special Buckets made to order.

Send for Catalog No. 38.

H. W. Caldwell & Son Co.
17th St. and Western Ave.
CHICAGO, ILL.
NEW YORK: Fulton Bldg.
Hudson Terminal, 50 Church St.
117 Main St., Dallas, Texas.



TABLETS OF RECORD in Metal, Marble and Stone for Exterior and Interior of Public Buildings, Office Buildings, Banks, Churches, etc. Designed and Executed to Client's Instructions and Limit of Expense designated. Correspondence Invited.

Illustrated data and photographs sent on request.

J&R LAMB
Studios, 23, 25, 27 Sixth Ave.,
New York.

OAK HILL GAS RETORT AND FIRE BRICK WORKS

The Parker-Russell
Mining and Manufacturing Co.
ST. LOUIS, U. S. A.

Fire Clay and Silica Products of Quality for Service---Especially for Kiln Construction.

Consulting
Prospecting
Testing
Designing
Constructing
Operating

Producer Gas-Fired Continuous Kilns and Dryers
Cost and Efficiency Systems. Old Plants Rehabilitated

JAMES P. WILLIAMS
CLAYWORKING ENGINEER
2803 N. Kings Highway
ST. LOUIS, U. S. A.

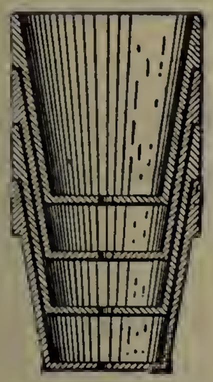
30% Average Cash Dividends

Did you ever investigate the **proven** high profits, assured safety and permanence of Silver Black Fox Farming?

Get the facts, then judge for yourself—not before. Unusual opportunity is offered to invest from $100 upwards on ground floor basis in conservatively capitalized, well managed company.

Send for prospectus which gives full facts, government reports, etc. Write promptly, as there is only a moderate amount of stock for sale.

Adirondack Ranch Co., Ind.
109 Arcade Bldg., Utica, N. Y.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

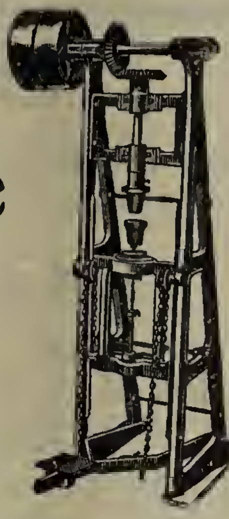
6,000 two-inch Pots; 3,500 five-inch Pots;

4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

1801 English Ave. INDIANAPOLIS, IND.



Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.

EASTON, PA., U. S. A.

Correspondence solicited.

New Books Which Are Being Offered To the Trade:

HOLLOW TILE HOUSE, by Fred'k Squires, Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

CEMENT, CONCRETE & BRICK, by A. B. Searle, Price, $3.00.

A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

Chattanooga Paint Co.,

Chattanooga, Tenn.

Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses--Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS

MILWAUKEE, WIS.

PHILLIPS & McLAREN CO.

PITTSBURGH, PA.

Builders of

Pittsburgh Standard

Dry and Wet

Grinding Pans

for Brick, Terra Cotta,

Sand, Cement, Ore,

Refractories, etc.

Also

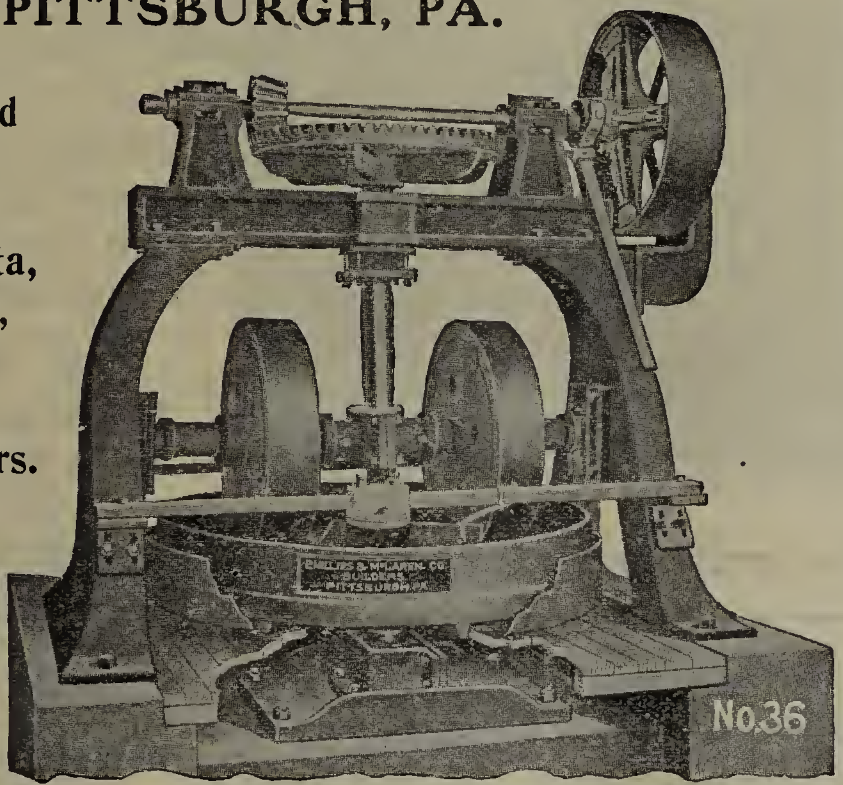
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office

Stephen Girard Bldg.

Philadelphia, Pa.


PHILLIPS & McLAREN CO. BUILDERS PITTSBURGH PA.
No.36

FOR SALE.

Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

T. A. RANDALL & CO.,
Indianapolis, Ind.

$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) $2.00

DO YOU KNOW

that in the BURNING OF BRICK a DRAFT GAGE is of greater advantage than a PYROMETER? We furnish both.

DO YOU KNOW

that for many years we have made the BEST DRAFT GAGES for all styles of kilns?

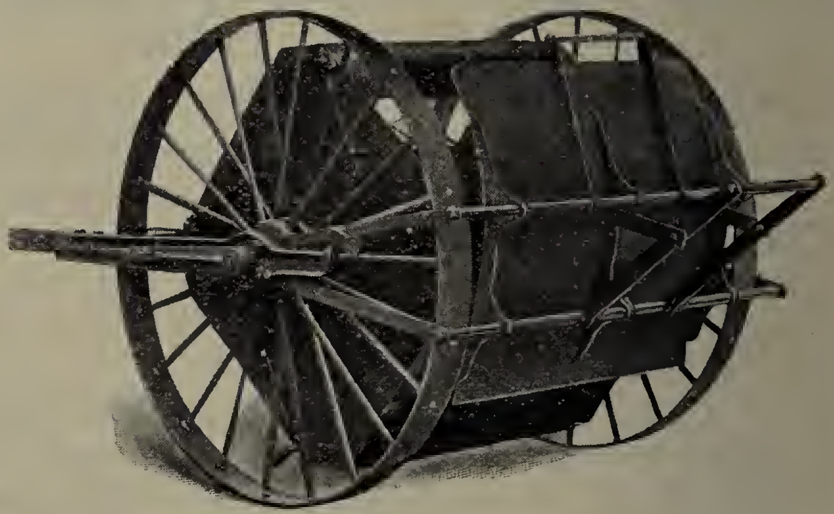
Write us for information of all kinds of controlling apparatus for clayworkers.

Ceramic Supply & Construction Co., Columbus, Ohio

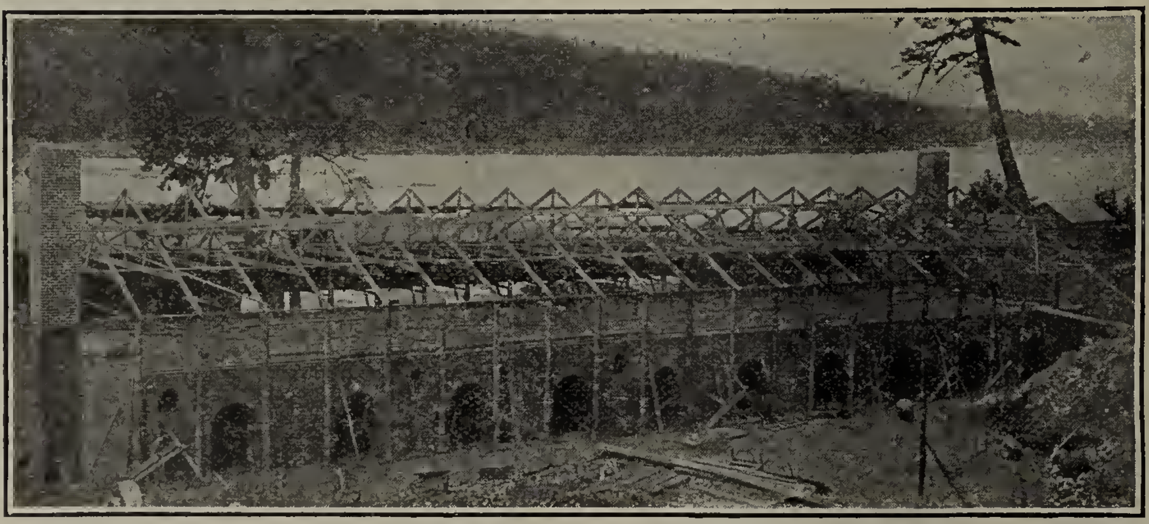
THE QUINCY IMPROVED GATHERER

used in connection with our **SPECIAL CLAY PLOW** is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
Quincy, Ill.



THE OREGON KILN



A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER.

HOTELS STATLER

BUFFALO - CLEVELAND
DETROIT

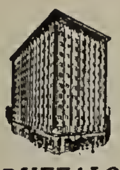
At Cleveland in February

THE National Brick Manufacturers' Association meets at Cleveland, February 20-26. Hotel Statler (1000 rooms, 1000 baths; $1.50 up) is headquarters.

Reserve Your Room Now

Early reservations are wise, because they make it certain that you can have what you want. Hotel Statler will gladly send rates and detailed information, if you are not familiar with the house.

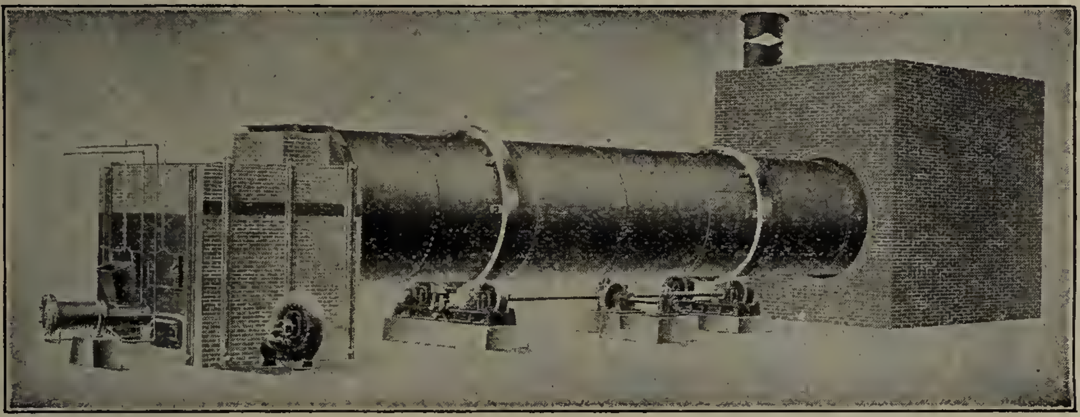
Every room has private bath, with automatic mixer and anti-scald device; thermostat, by which the guest may regulate temperature of room; running ice-water, and other unusual features that make for comfort. Morning paper delivered free to guest-rooms. Club breakfasts served in all restaurants.



BUFFALO
450 Rooms
450 Baths

DETROIT
800 Rooms
800 Baths

CLEVELAND
1000 Rooms
1000 Baths



ROTARY CLAY DRYER

DRY YOUR CLAY
AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

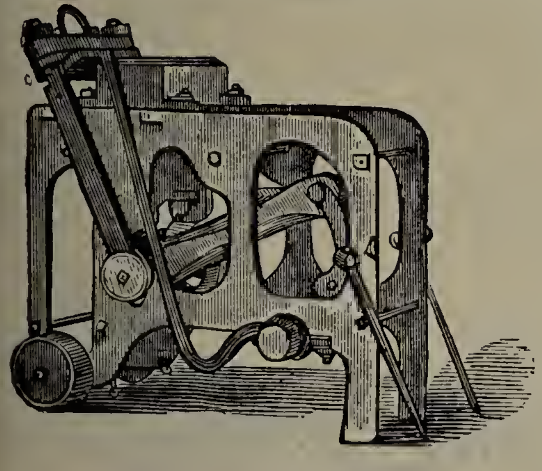
American Process Co.
68 William Street
NEW YORK

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)

Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio

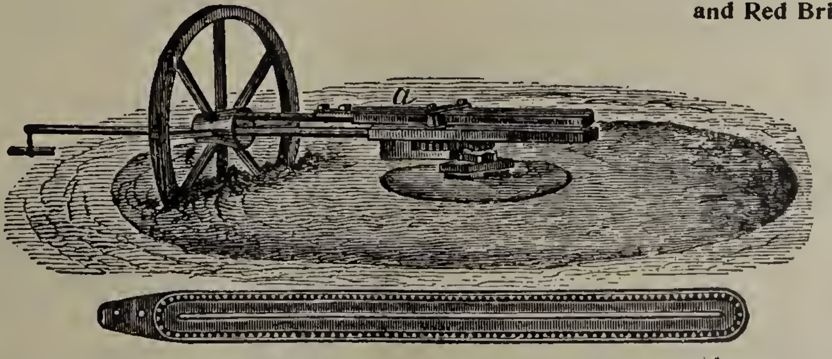


RED BRICK PRESS.

Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞ Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

Something New

"Don't fail to visit suite 216 and 218, Statler Hotel, while attending the National Convention. The big surprise of the convention will be demonstrated to the delegates who are interested in entering a new field for their product, as well as creating a market for the off-grade material which has always proved a loss to the paving brick manufacturer. Every brick man welcome, and will be well repaid for his visit. Don't forget this appointment, suite 216 and 218 Statler Hotel."

The Aspha-Brick Corporation

1904 Whitehall Building
New York, N. Y.

538 Otis Building
Chicago

The 30th Annual Convention

OF THE

National Brick Manufacturers' Association

The American Ceramic Society,
The National Paving Brick Mfrs.' Association
and The National Clay Machinery Association

WILL BE HELD AT

CLEVELAND

MONDAY TO SATURDAY, FEBRUARY 21st to 26th, 1916

The STATLER HOTEL will be Headquarters

The Sessions of the American Ceramic Society will begin Monday, the 21st.

The Sessions of the National Paving Brick Manufacturers will begin Monday the 21st.

The Sessions of the National Clay Machinery Association will begin Tuesday, the 22d.

The Sessions of the National Brick Manufacturers' Association will begin Wednesday afternoon and continue Thursday and Friday, the 23d, 24th and 25th.

A FULL OFFICIAL REPORT of the N. B. M. A. Convention which bids fair to be most successful, will be given in the March CLAY-WORKER including papers, discussions and portraits of prominent members. Next to attending the Convention the best thing a brickmaker can do is to read THE CLAY-WORKER'S report. It is so full and accurate that those who attend the Convention would not be without it and those who don't go can't afford to miss it. The consensus of opinion among progressive brickmakers is that the Convention Number of THE CLAY-WORKER is the most valuable publication of the year. If you are not already a regular subscriber, don't neglect to send in your order in time to get the March or Convention number.

THE CLAY-WORKER is now in its **33d year** and is recognized the world over as the best clayworkers' magazine published in the English language. It has more readers at home and abroad than all its followers combined. Take THE CLAY-WORKER and you get the best value for your money. $2.00 a year. Every issue is worth twice that sum.

1916			FEBRUARY			1916
Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21-	22-	23-	24-	25-	26
27	28	29				

Advertising Matter to Insure Insertion
Must be Received by the First of the Month.

T. A. Randall & Co., Inc.

PUBLISHERS,

INDIANAPOLIS, IND., U. S. A.

The Clay-Worker is Unequaled as an Advertising Medium.

ELLIS LOVEJOY

Consulting Engineer

COLUMBUS, OHIO

GEOLOGICAL EXAMINATION OF PROPERTIES

CLAY TESTING

INVESTIGATION OF MANUFACTURING PROPOSITIONS

PLANTS DESIGNED, CONSTRUCTION SUPERINTENDED
AND OPERATIONS DIRECTED

DRYERS, FURNACES, KILNS

REMODELING OLD PLANTS GIVEN SPECIAL ATTENTION

DETELOPMENT OF NEW LINES OF PRODUCTS

APPRAISAL OF PLANTS

WHY NOT INVESTIGATE—

Steam Dried Brick Don't Whitewash.

You Get Perfect Drying---You Are Not Experimenting When You Use

THE NATIONAL EXHAUST STEAM DRYER

This dryer dries all kinds of clay products, kaolin, gypsum, etc. We guarantee that the National Exhaust Steam Dryer will dry your ware in the minimum time and at the mini-

The cost of heating this dryer during the day is absolutely nothing, while the expense of creating steam during the night is less than that of any other

THE NATIONAL DRY KILN CO., INDIANAPOLIS, IND.

Mention The Clay-Worker.

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Bricklaying System, by Frank B. Gilbreth. Price $3.00.

A book whose 330 pages are filled with rules and hints for the foreman and bricklayers, designed to increase the output of the workmen and enable them to do difficult work in the best manner.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

Drying Brick, by W. D. Richardson. Price 25 Cents.

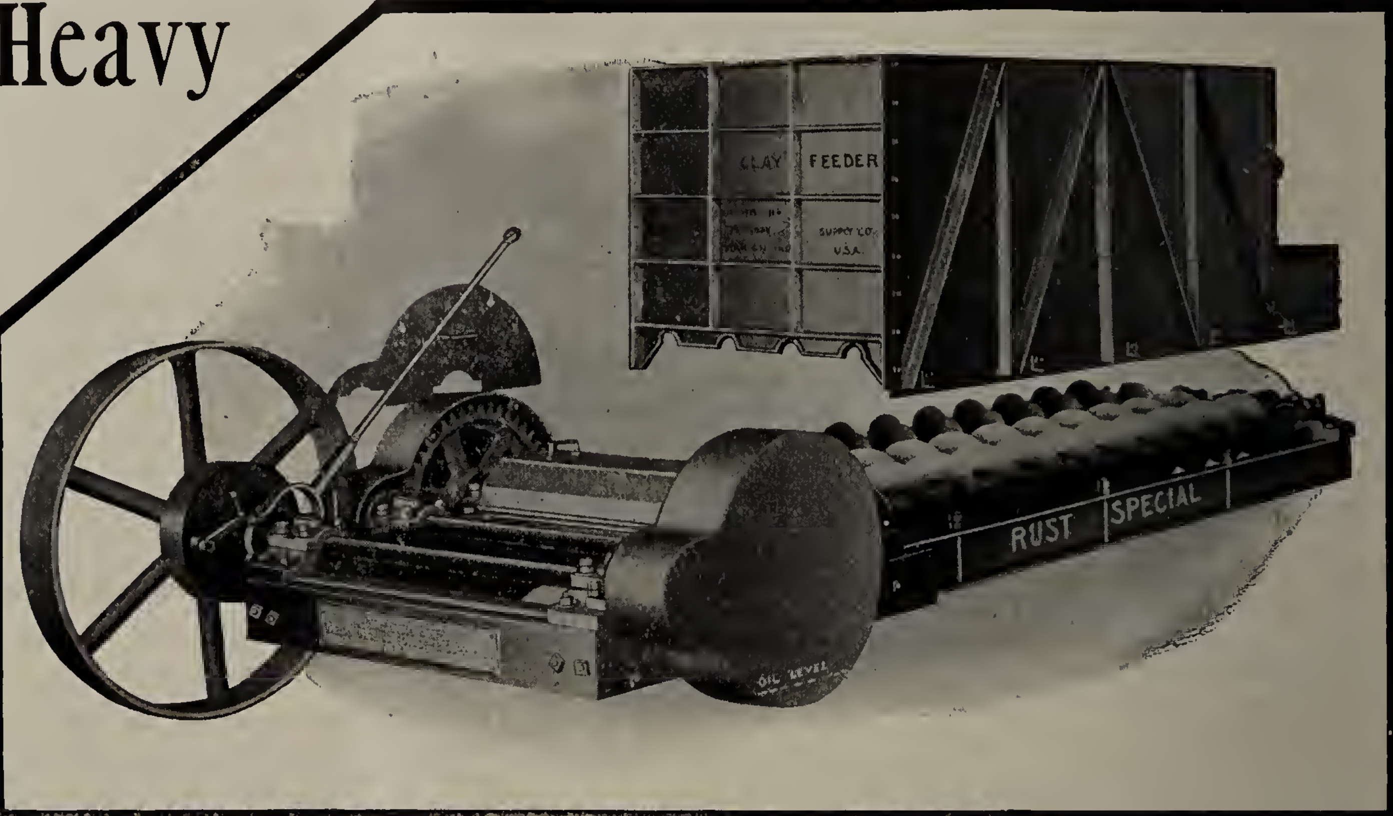
A little booklet giving and explaining the various styles of dryers, etc.

T. A. RANDALL & CO.

Indianapolis, Ind., U. S. A.

MARION LEADERS

Our Extra Heavy "RUST SPECIAL" CLAY FEEDER

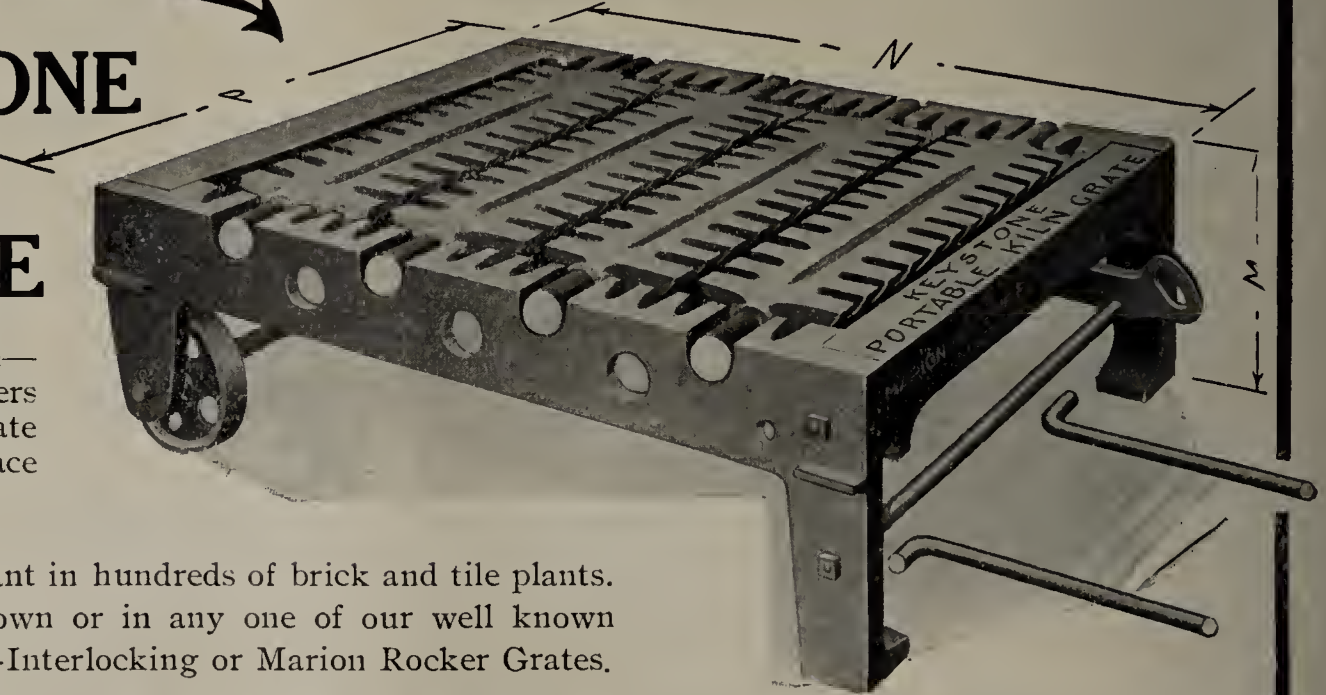


Will help you to get full capacity out of your dry pan, pug mill auger---insure a regular delivery to your off-bearers, speeding them up so you will get greatest efficiency from them---and also cuts out the labor of two men. It tempers the clay perfectly---improves the product---speeds up the plant.

Made extra heavy for hard work and big production. Gears are encased and run in oil, and are made either of semi-steel or high grade crucible steel. Spirals are heavier than other types.

We know the "RUST SPECIAL" Clay Feeder will do all we claim for it—that's why we sell it under an absolute guarantee. Ask for our Special Bulletin on this.

The KEYSTONE PORTABLE KILN GRATE



The Ideal grate for kiln use—made durable throughout—offers flat surface for fuel—no intricate parts—easy to repair or replace sections.

This Grate fills a long felt want in hundreds of brick and tile plants. It can be furnished just as shown or in any one of our well known styles: Shear-Klean, Marion-Interlocking or Marion Rocker Grates.

Marion Machine, Foundry & Supply Co.

P. O. 156, Marion, Indiana

THIS DRYER WILL SAVE YOU MONEY

THE "Wellington" Improved Steam Pipe Rack Dryer combines every possible Economy with the highest degree of Efficiency.

IT is a low pressure vacuum system with the FIRST COST LOWER than any other dryer. It can be installed at LESS EXPENSE and operated at a big saving in power and labor.

WE will give you the facts and figures to PROVE IT or you can ask any of the many satisfied users of this economical dryer.

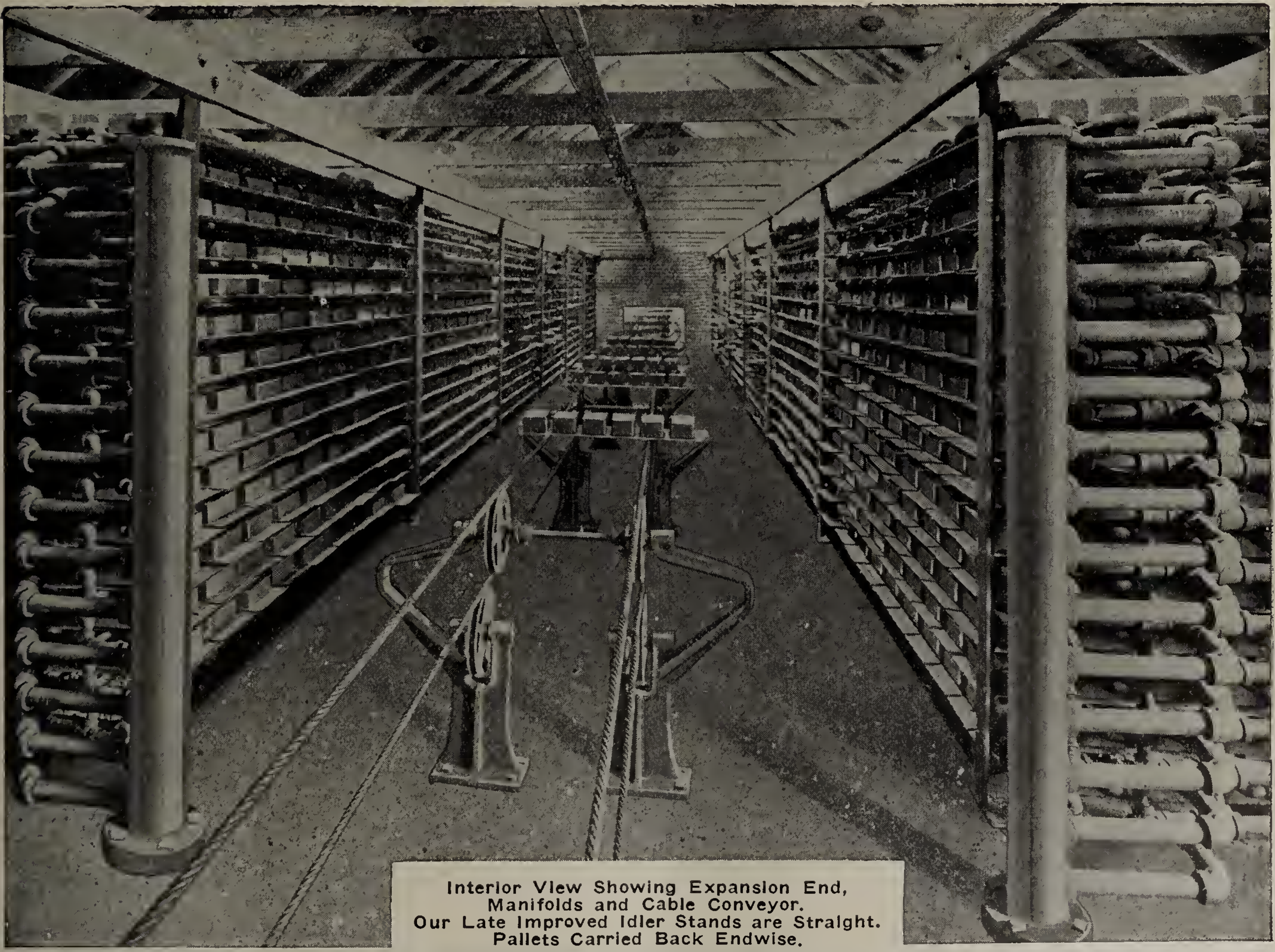
WHAT ONE OF OUR MANY SATISFIED CUSTOMERS HAS TO SAY.

Wellington Machine Co.,
Wellington, Ohio.

Have found your Dryer a grand success. We are having no trouble and are actually drying brick in this Dryer that does not cost us a cent. The Wellington Dryer is one of the best on the market. THE OHIO BRICK CO.,
A. R. Kuhlman, Mgr., Toledo, Ohio.
June 29, 1915.

Ask Any of the Following Representative Brick Companies:

Barkwill Brick Co., Cleveland	120,000 capacity
American Bldg. Brick Co., Cleveland	30,000 capacity
Collingwood Brick Co., Toledo	35,000 capacity
Ohio Brick Co., Toledo	35,000 capacity
Walker & Frank Brick Co., Detroit	35,000 capacity
Farr Brick Co., Cleelandv, H plant	120,000 capacity
Standard Brick Co., Cleveland	120,000 capacity
Owen Hatten Brick Mfr., Philadelphia	25,000 capacity
Thornton Bros., Rudyard, Mich	15,000 capacity
Ithaca Brick & Tile Co., Ithaca, N. Y.	30,000 capacity
Mercier-Bryan-Larkins Brick Co., Detroit	60,000 capacity
The Cook & Brown Lime Co., Oshkosh, Wis.	40,,000 capacity



Interior View Showing Expansion End, Manifolds and Cable Conveyor.
Our Late Improved Idler Stands are Straight.
Pallets Carried Back Endwise.

The Wellington Machine Company

Wellington, Ohio

WM. SCHLAKE, *President*　　WM. G. BOHNSACK, *Secretary*
C. B. OBERMEYER, *Vice-President.*

ILLINOIS BRICK COMPANY

Room 1717
111 W. Washington St.
CHICAGO

Telephone
Main 17

AND THEY SAID IT COULDN'T BE DONE!

More than one hundred firms and individuals in a dozen different states have united in a campaign to educate the American builder in the way of SAFE building.

The men back of this national movement represent every accepted fire-safe material and include engineers, architects, contractors, fire engineers and city officials.

This is not a campaign to sell any one material, nor is it an effort to "knock" any type of construction.

The medium of this great movement is an organization devoting its whole enery to convincing prospective builders that it not only is safer and better to build with materials that will resist fire, but that it actually is cheaper in the long run.

This organization is known as THE SAFE and it is making converts every day, and in the territories where it is active the building records show a marked increase of the use of fire-safe materials.

Why aren't you a part of this movement?

Let us send you free copy of address delivered by John J. Thomas, The Lloyd-Thomas Co., Chicago, which PROVES that safe buildings are cheapest.

THE SAFE

Society Advocating Fire Elimination

R P. Stoddard, Secretary

356 Leader-News Building CLEVELAND, OHIO

W. D. RICHARDSON

announces his return, March 1st, to his engineering business after five more years of interesting and successful experience in brick manufacture — in charge of two well-known face brick factories.

He desires to offer his knowledge and experience to a larger number of manufacturers and thus to be of greater value to the industry to which he has devoted the best years of his life.

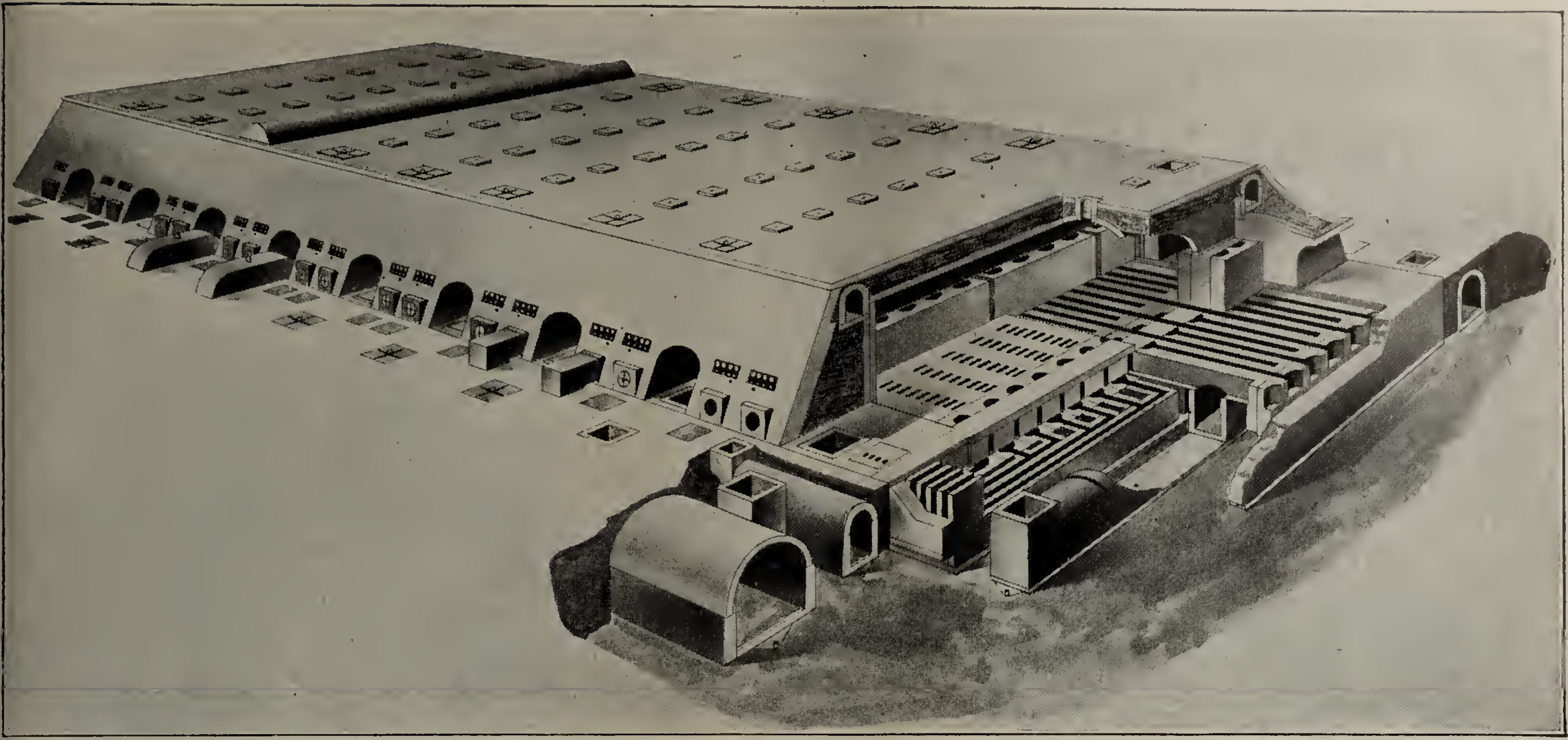
He will be available for service in investigating manufacturing propositions, designing and constructing new brickmaking plants, driers and kilns, remodeling old plants, correcting faults of manufacture and uneconomical methods of operation and in the development of new products and placing unprofitable establishments upon a paying basis.

He will act as consulting engineer for the solution of special problems or, to a limited number, by the year, upon reasonable terms.

He will make a specialty of kilns and burning, both for improved quality of ware and for greater economy in labor and fuel. He confidently expects that his studies in kiln design and his long experience in the construction and management of kilns, especially of the regenerative, continuous class, will make him a leader in this important line. His **Producer-Gas-Fired-Continuous Chamber Kiln** is shown on the opposite page. Other types of continuous kilns of superior design will be presented on these pages from time to time in the near future.

His services will be given in connection with the **Ceramic Supply and Construction Company,** with headquarters at **171 West State St., Columbus, Ohio.**

Correspondence solicited.



The Richardson Producer-Gas-Fired Continuous Kiln

(Patented in the United States and Canada)

Embodies the latest developments in the art of burning clay products.

Designed on scientific lines by a practical man.

Special superior features in advance of anything yet offered to the clay industry.

Not an experiment. One kiln in successful operation for the past year. Another large kiln under construction by a prominent manufacturer.

Complete detail drawings on exhibition at the N. B. M. A. Convention, Room 1034, Statler Hotel, Feb. 21-25.

SEE RICHARDSON FOR KILNS

Ceramic Supply & Construction Co.

Columbus, Ohio

JOIN THE

BOOST

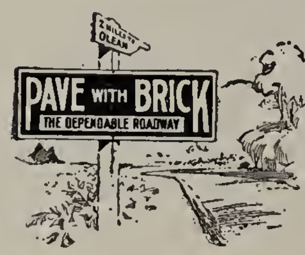
BUILD WITH BRICK

BOOST

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.



IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $5.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $6.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

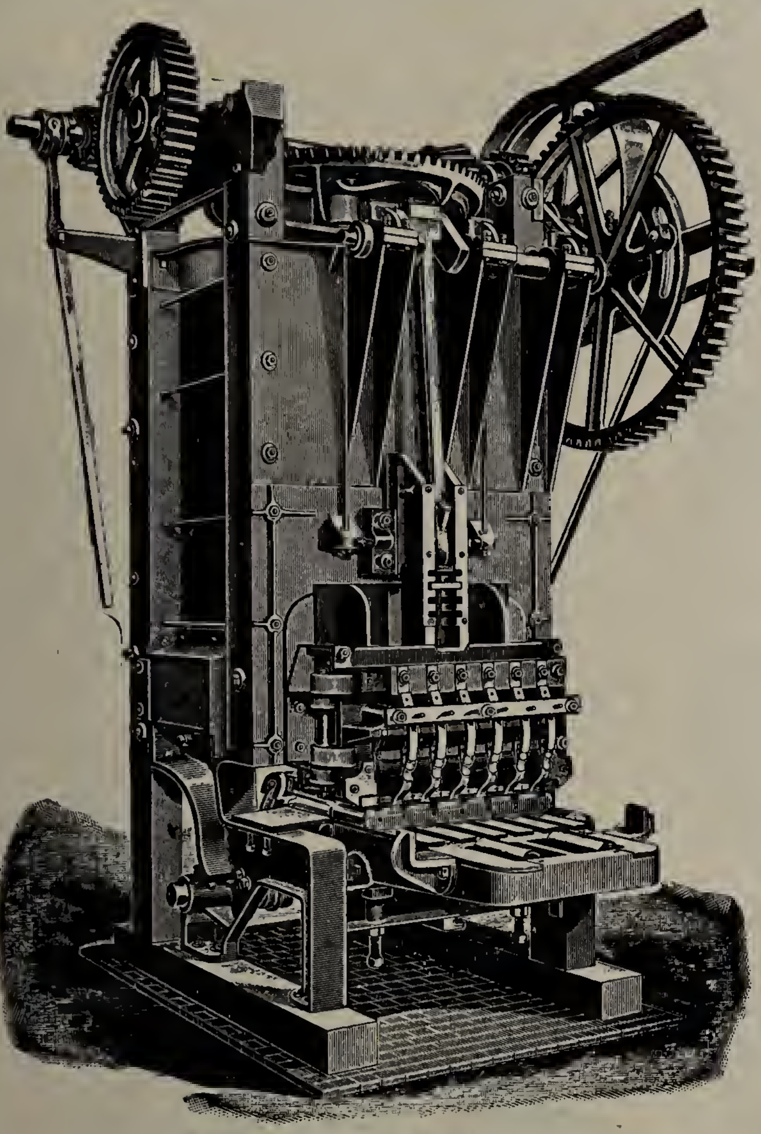
Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

(Cross out the items not wanted, fill in and mail us the coupon.)



"New Haven" Vertical Machine

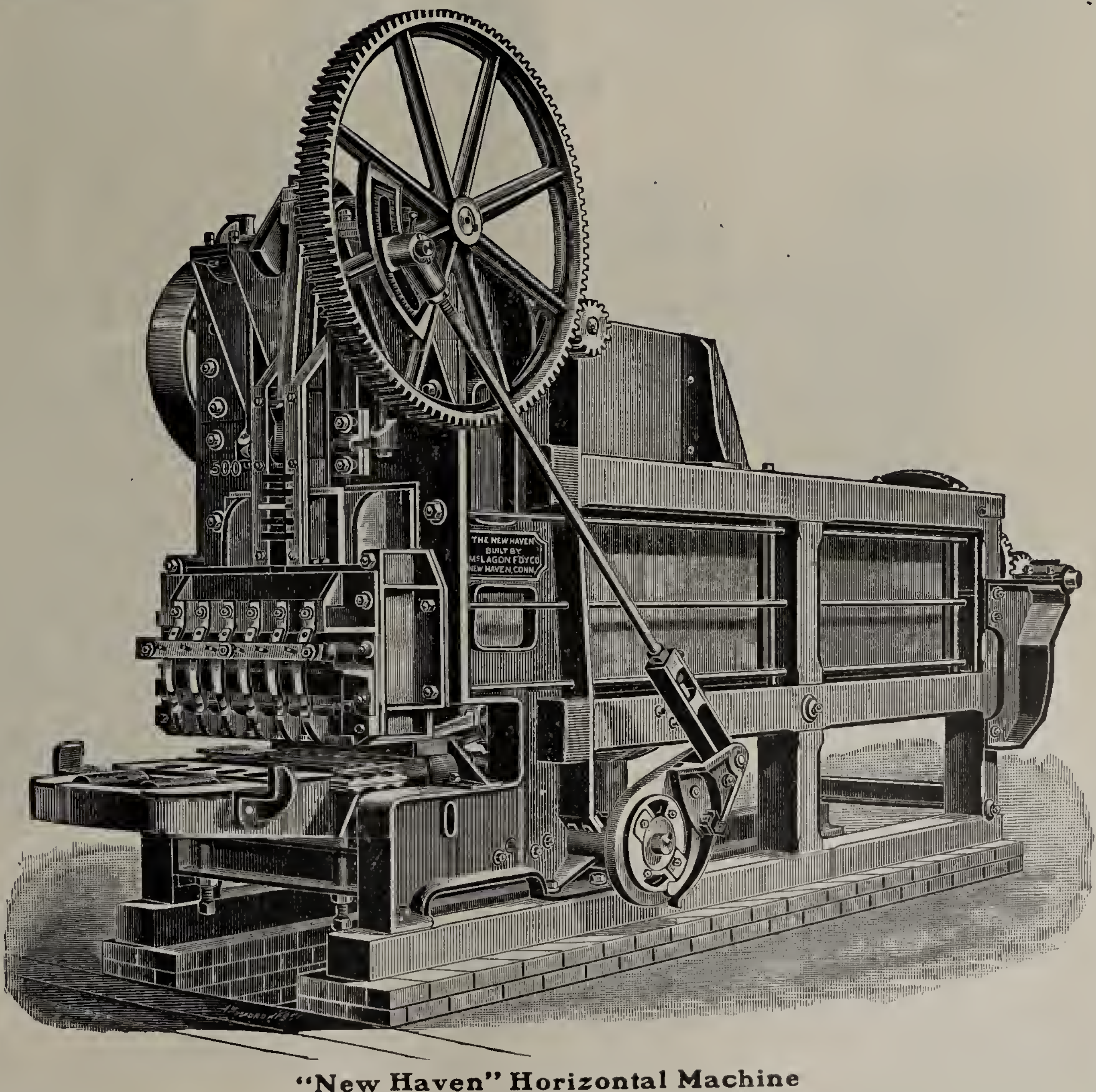
Endurance the "Crowning Quality"

New Haven Brick Machines are not Experiments. They are particularly adapted for hard service.

Their history is a record of unusual success. Continued results determine the economic value of a machine rather than first cost, and on this basis NEW HAVEN Machines have been proved to be the least expensive as well as the greatest profit-winners.

The Eastern Machinery Co.,
New Haven, Conn.

New
Haven
Machines
Have
No
Equal
For
Earning
Capacity.
They
Are
Built
To do
The
Work
And
They
Do it.

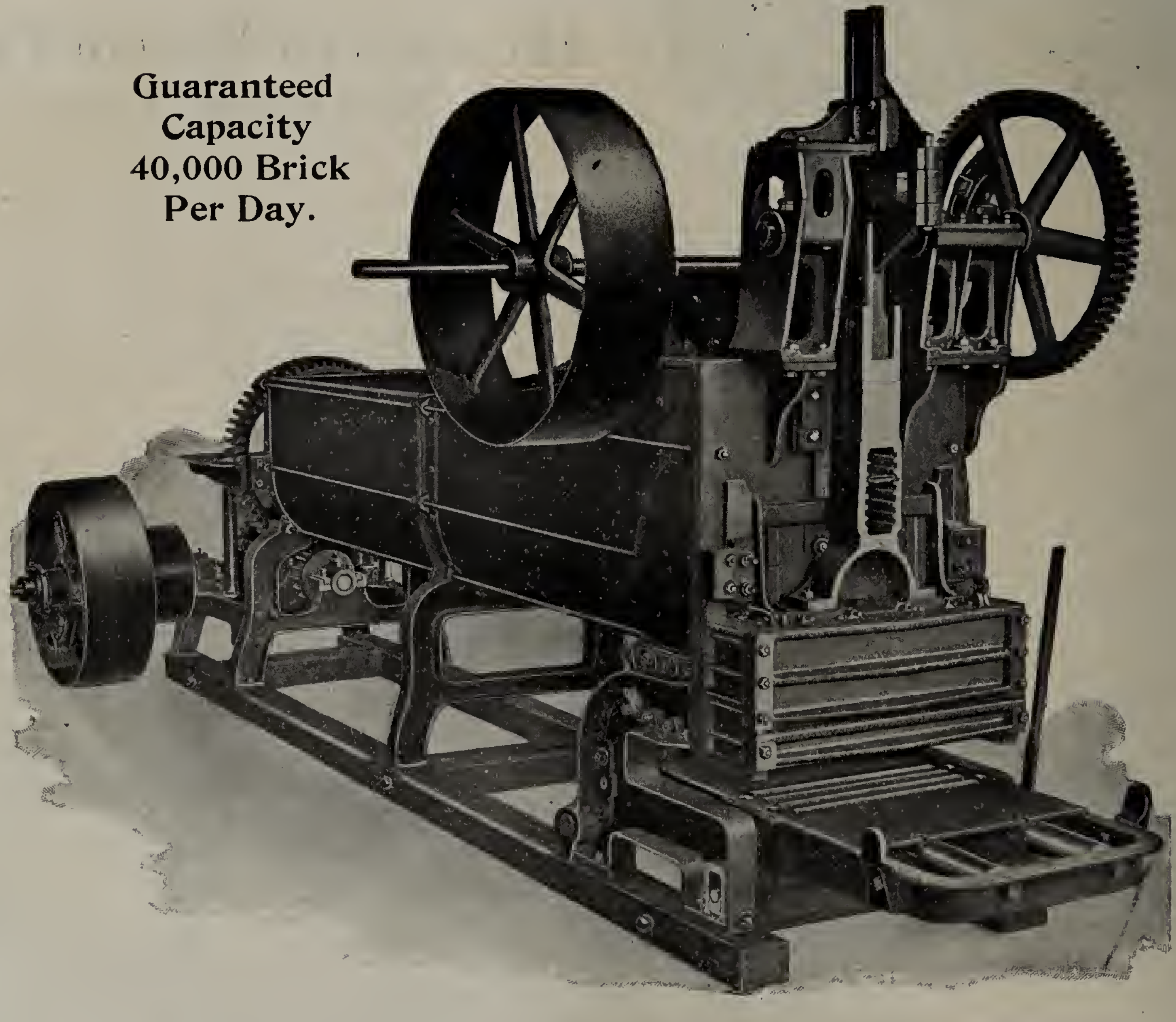


"New Haven" Horizontal Machine

POTTS SELF=STRIKING SOFT MUD and FIRE BRICK MACHINE

C. & A. Potts & Co.
Machinery & Supplie
Mean
Service.

Guaranteed
Capacity
40,000 Brick
Per Day.



Simple, strong and durable.
Self=striking, never fails, and is always on the job.
No working parts under machine or in the clay.

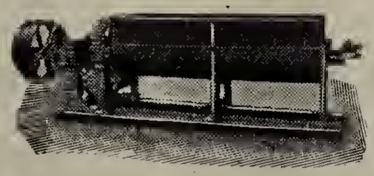
WRITE US AT ONCE AND SAVE MONEY.

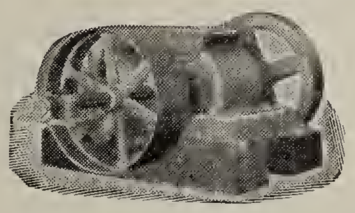
Our Products Have Quality.

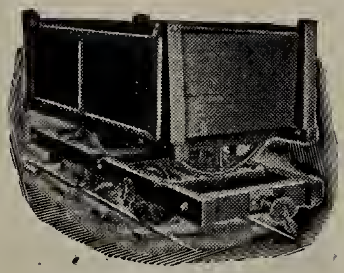
We Back Up Our Equipment With a Guarantee.

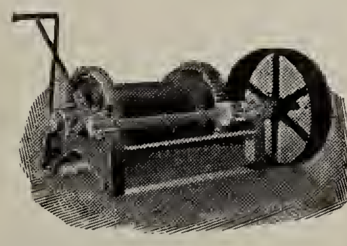
Our Prices Are Right.

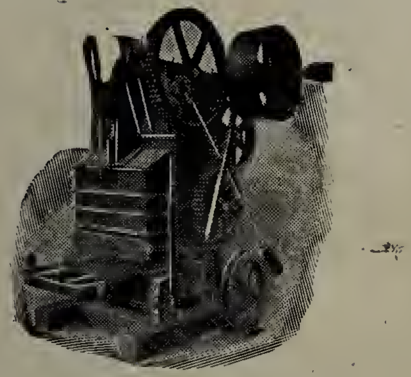
Hundreds
of Satisfied Users
Attest
Quality.

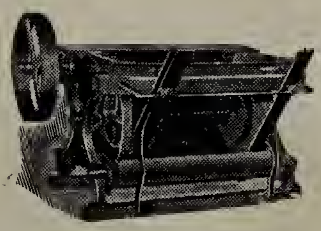

Double Geared Pug Mill


Style "P" Roller-Crusher

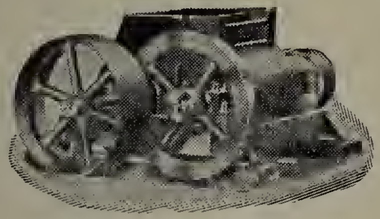

Side Dump Car

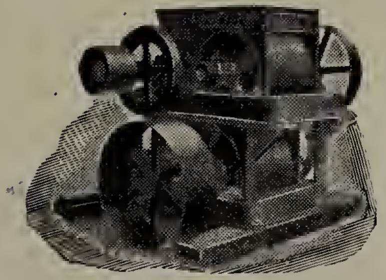

Style "B" Winding Drum

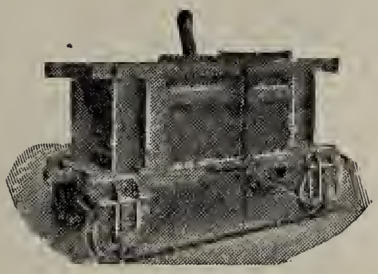

Vertical Brick Machine

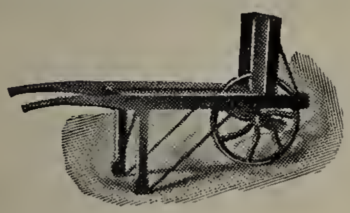

Style "A" Mould Sander

Mule Truck

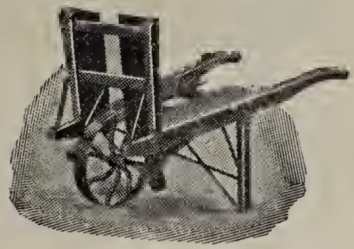

Style "A" and "P"
Disintegrator

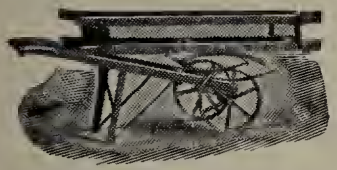

Style "P" Compound
Disintegrator and Crusher

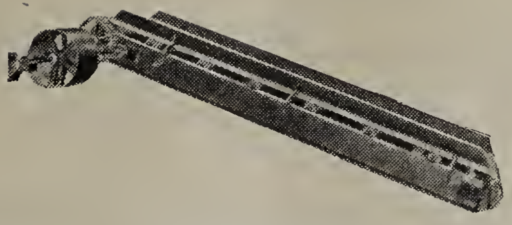

Bottom Dump Car

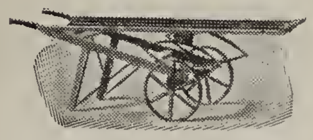

No. 6 Barrow

The Potts Rocker
Grate
For any size fire box
on boiler or kilns


No. 2 Barrow


Double Deck Truck


Clay Elevator.


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

**Write us for
Prices.**

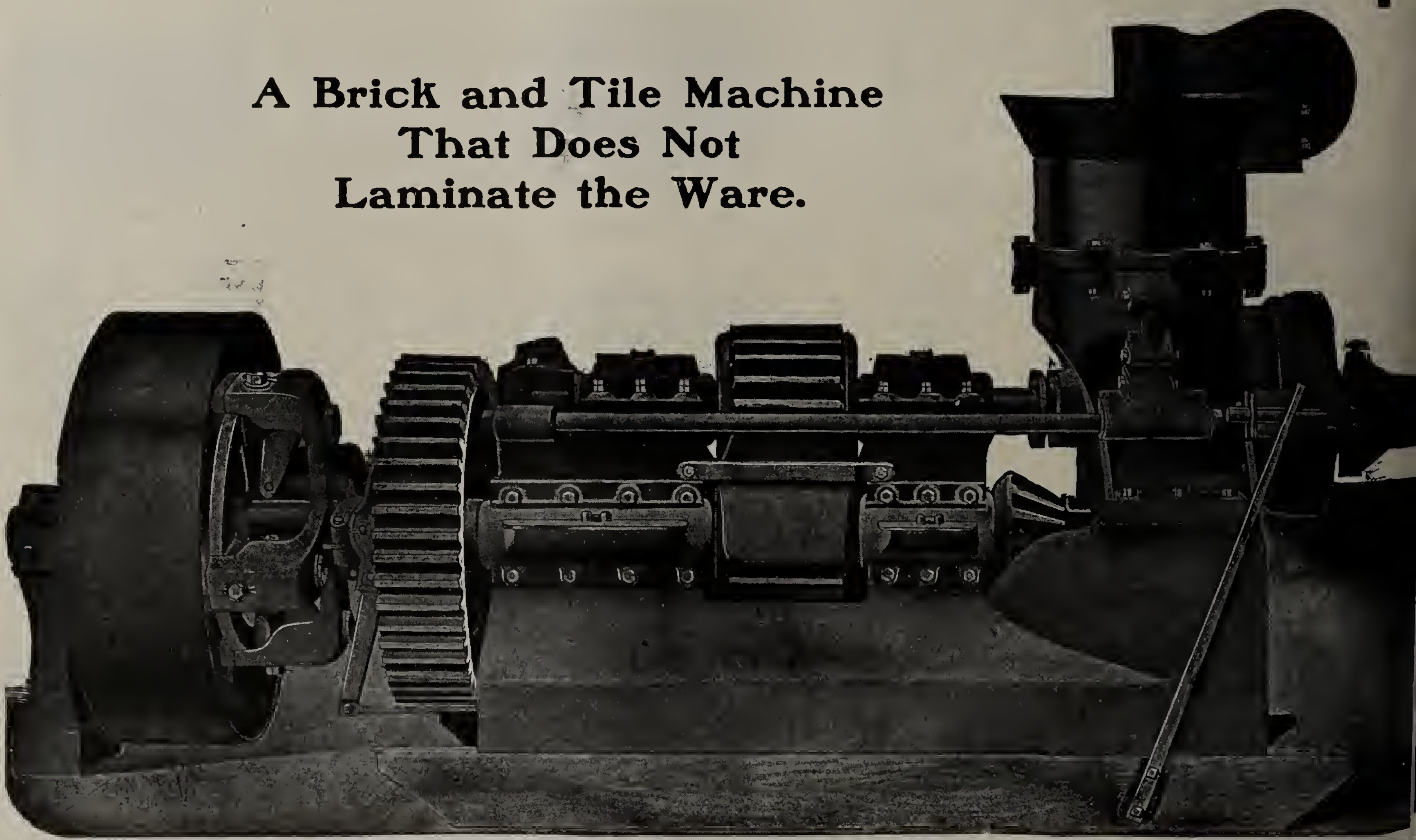
**If it's to be Had
We Have it.**

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

**A Brick and Tile Machine
That Does Not
Laminate the Ware.**



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

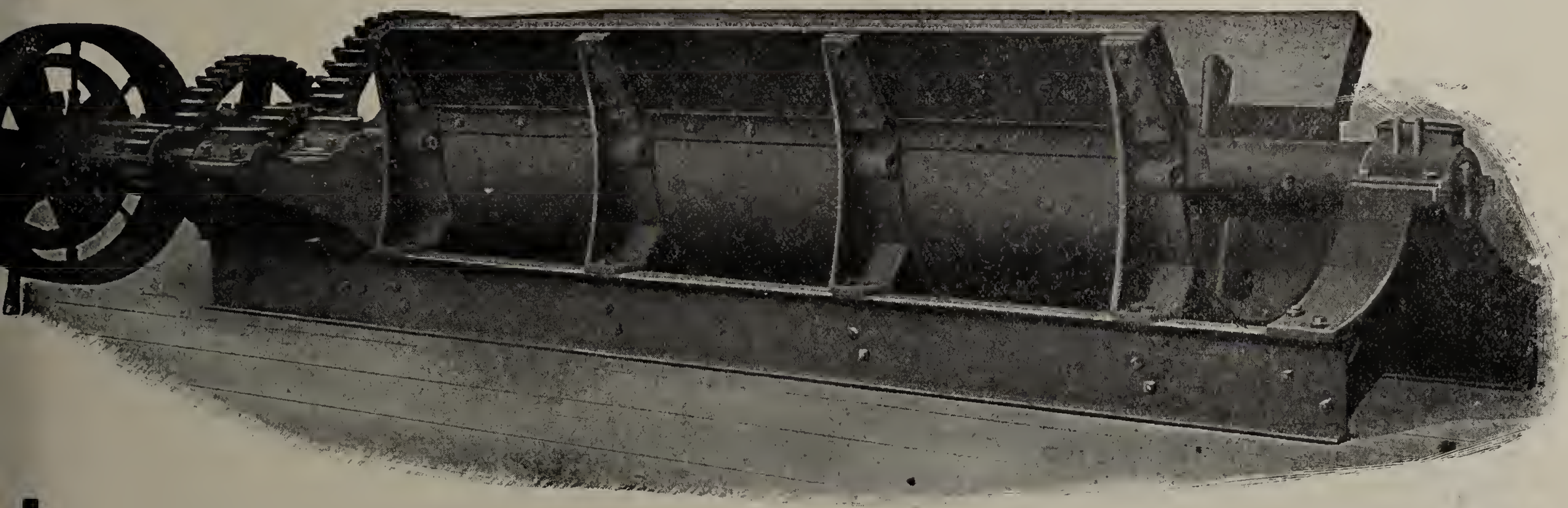
THE WALLACE MFG. CO.

FRANKFORT, IND.

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

GRANULATORS

Too many plants are running without Granulators, but it isn't our fault. We have them in large, small and medium sizes, spur and bevel geared drives, pushing and pulling patterns. A Granulator to suit every plant. Something into which you may dump a carload of clay, and from which you may get a uniform delivery with large lumps reduced to a size which the machine ahead can handle.



THE BREWER NO. 17

is a spur-geared pushing granulator of the large size. It weighs 18,000 pounds. The tub is 12 feet long. The granulating shaft is 10 in. diameter. The knives (48 of them) are forged from hard, high-carbon steel, and each one is independently adjustable for pitch. The back thrust bearing is of the grooved marine pattern. The main gears are 8-in. face, semi-steel. It is big and strong enough for anybody.

The smaller sizes range down in weight to 5,000 pounds.

See our catalog for details and specifications.

It will be mailed upon receipt of your request.

H. BREWER & COMPANY, Tecumseh, Mich.

THE PRODUCER GAS DRYER

ACTUALLY

Does Dry Bone Dry
Because it can be operated the full limit of heat and circulation.

Does Not Scum the Ware
Because no products of combustion touch the ware.

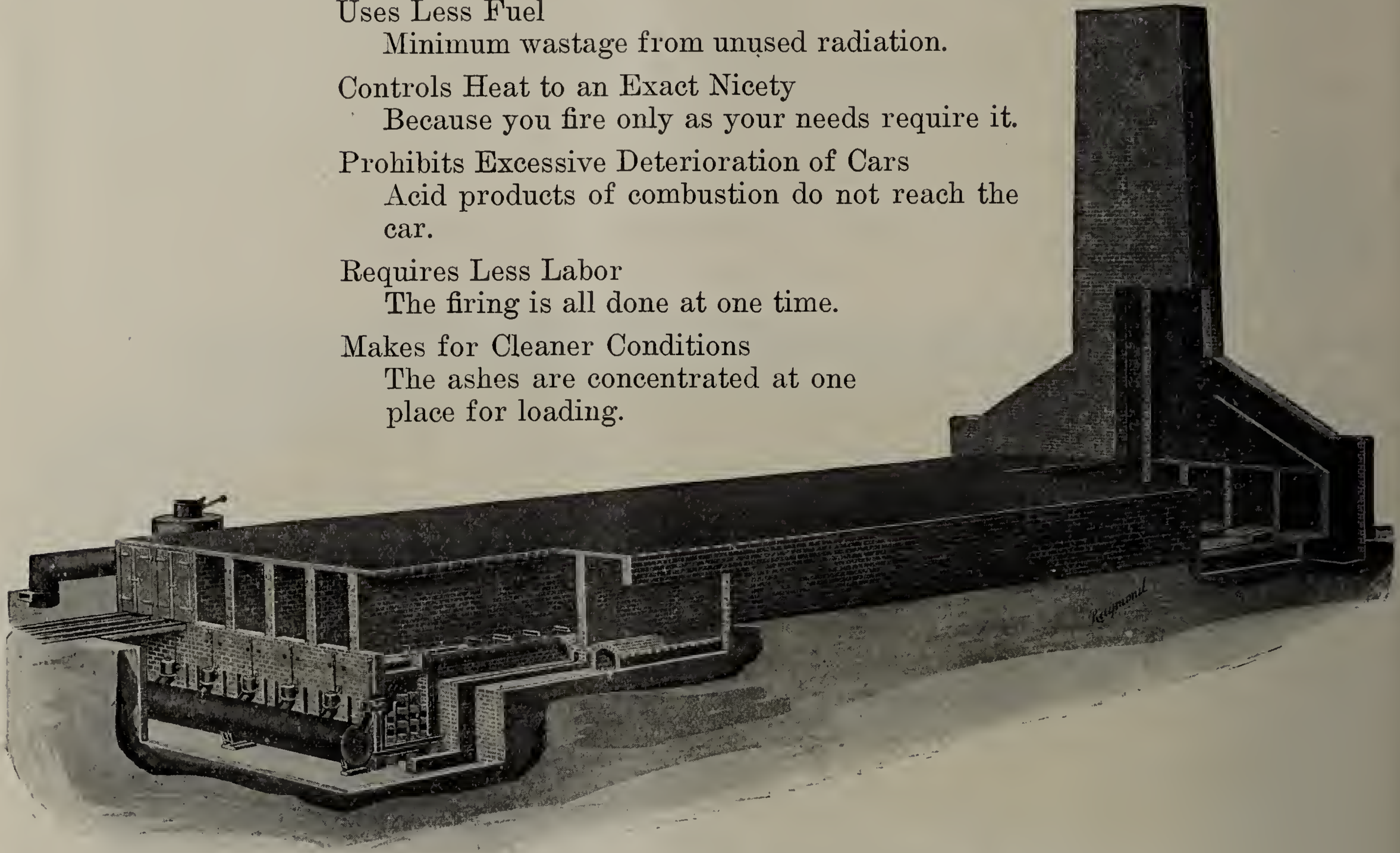
Uses Less Fuel
Minimum wastage from unused radiation.

Controls Heat to an Exact Nicety
Because you fire only as your needs require it.

Prohibits Excessive Deterioration of Cars
Acid products of combustion do not reach the car.

Requires Less Labor
The firing is all done at one time.

Makes for Cleaner Conditions
The ashes are concentrated at one place for loading.



Is Not Affected by Weather Conditions
Heat and draft can be regulated in but a few moments' time.

Dries Tender Clays Without Checking
Circulation and heat under absolute control and independent of each other.

Can be Used for Its Minimum and Maximum Capacity
Every tunnel independent of the other.

Write for more information.

We also manufacture a complete line of everything for Clayworkers' needs. Brick Machines, Pug Mills, Dry Pans, Cutting Tables, Represses, Continuous Kilns, and all the small items for use about your yard.

INTERNATIONAL CLAY MACHINERY CO.

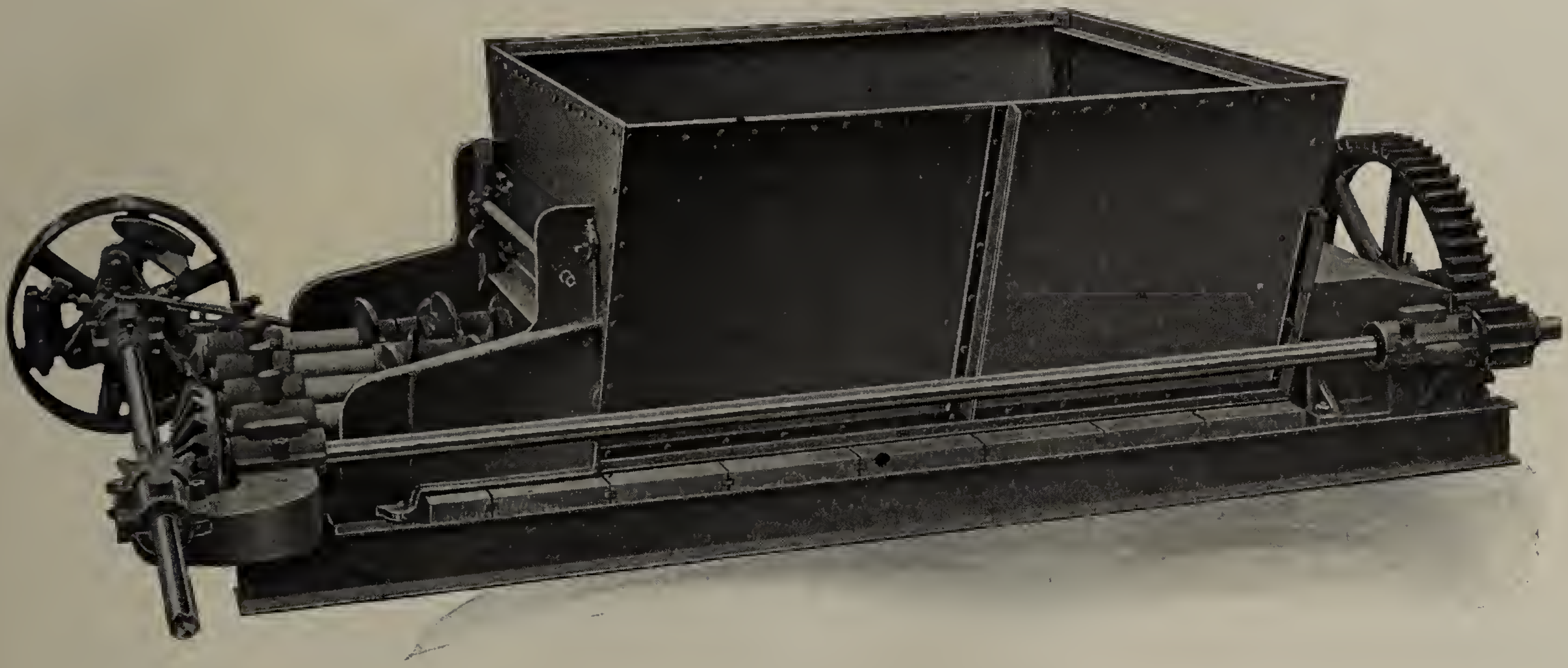
Dayton, Ohio, U. S. A.

Mention THE CLAY-WORKER.

ONE Brick Machine may look as good as another, may be built first class mechanically, and of ample weight, and still prove a disappointment.

It is the hidden effort and experience back of the Steele Machinery which give the results.

A proper relation of parts makes the difference between the finished and easy output of the Steele Machinery and the labored effort of improperly designed machinery.



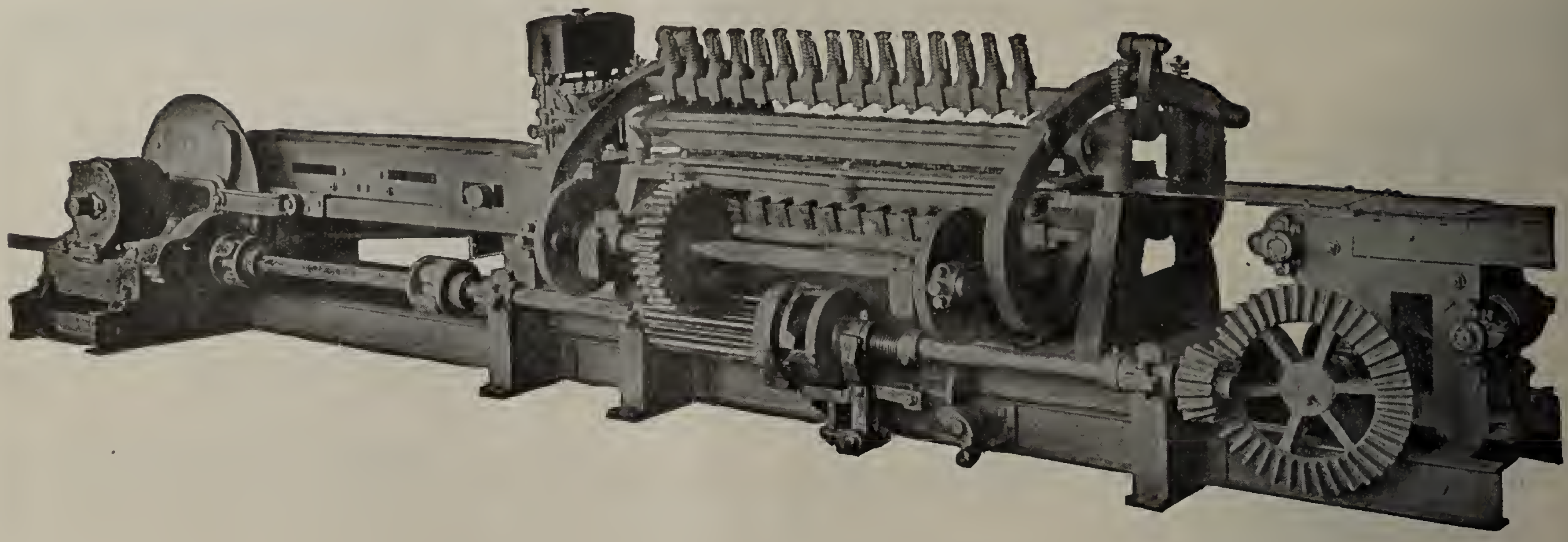
The Steele Even Feeder is extra heavy—weighing 6,500 pounds—at the same time it is so well balanced that it requires very little power. The connecting gears are spur type and run in oil.

These Feeders are giving good results where others failed.

J. C. STEELE & SONS

Statesville, N. C.

Western Representative: George H. Smith, 510 Reliance Bldg.,
Kansas City, Mo.



Model T 60 Reciprocating Automatic Cutter

For building brick, fire brick, and repressed or Dunn Wire-Cut-Lug Pavers.

A thoroughly dependable automatic cutter—

Sure-Acting, because its mechanism is positive;

Economical, because of the very few wearing parts;

Understandable, because of the extreme simplicity of its mechanism.

The cutter that is now cutting most of the paving block made.

FIND D. M. of P. E.
IN ROOM FOUR FORTY-THREE

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

Mention THE CLAY-WORKER.

For
Sixty-Three
Years
The Name

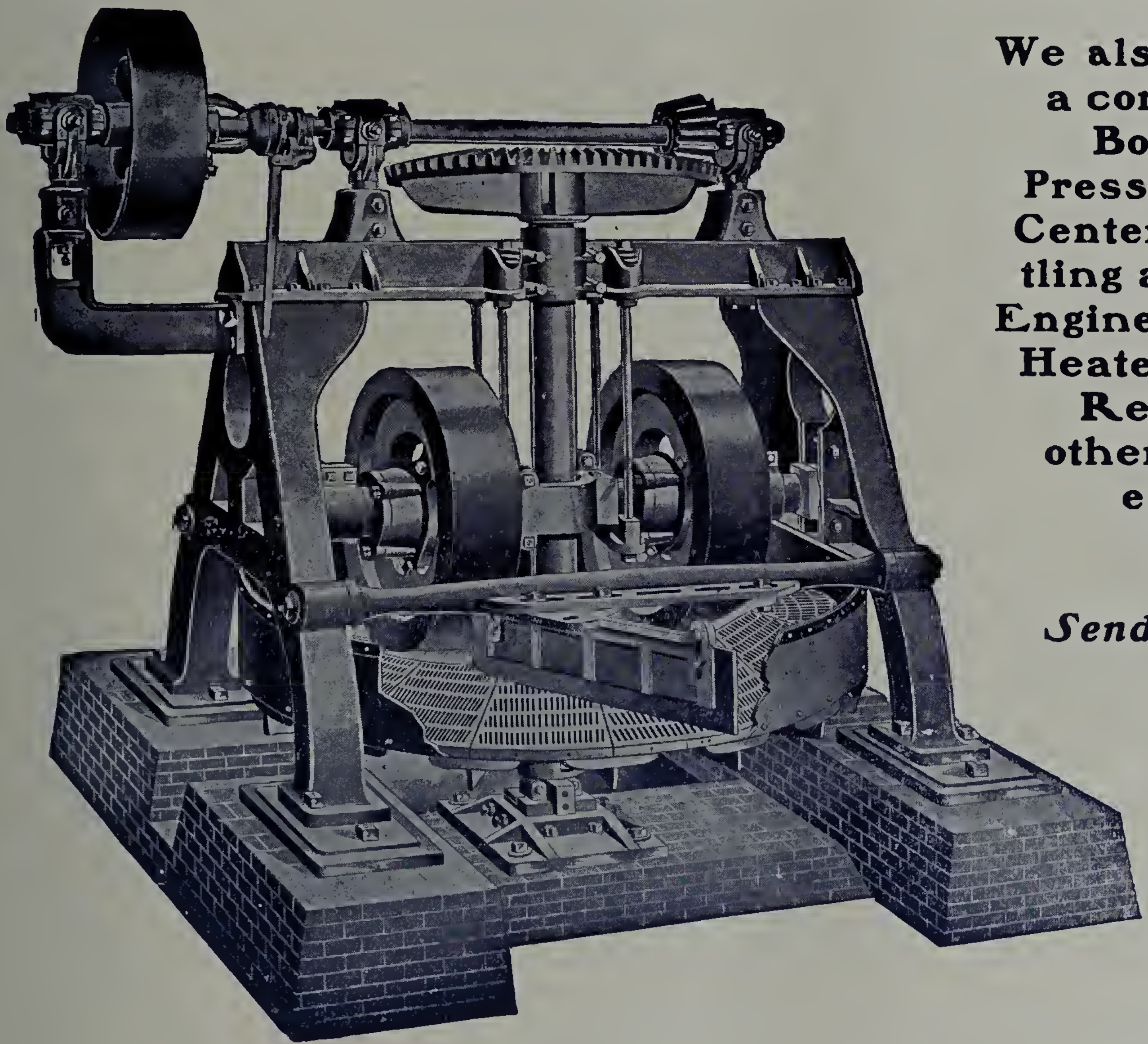
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO." Chicago.

The Wise Man of FATE

"Ask Fate" About "The Plymouth"

At the Cleveland Conventions

If you are paying too much for hauling your clay from the pit or moving your finished product from one point to another, tackle a Fate Free Service Man at the Cleveland conventions Feb. 21-26. (You'll know him by his badge, "Ask Fate.")

The Fate Free Service Men are loaded with information about the "Plymouth" Gasoline Locomotive and can give you scores of cases where it has cut down costs in clay plants.

The Plymouth

Gasoline Industrial Locomotive

Saves Money in Hauling Clay

No clay plant is too small—none too large for the "Plymouth" not to cut down hauling costs. Frank Fleigle, Morrisonville, Ill., replaced two horses with a "Plymouth" on a short haul duty and says the "Plymouth" costs him much less than the horses. The Fredonia Brick Co., Fredonia, Kans., with an 800-ft. haul and 100,000 brick per day, does this work with a "Plymouth" at a daily cost of $2.85 for labor, gasoline and oil.

Here's What Biglow Says:

The E. Biglow Company, New London, Ohio, says that the "Plymouth" is far more economical than any system of hauling it ever tried and much cheaper than horses and dump cars. Here are some extracts from a letter written by this concern:

> We have had the "Plymouth" in operation for the past year and our repair bills have been practically nothing.
> As to fuel costs we are consuming an average of five gallons of gasoline and three-fourths of a pint of lubricants per day.
> An ordinary day laborer at $2.20 per day operates the "Plymouth."
> The "Plymouth" is far cheaper to operate than any other system we ever tried and certainly more economical than horses and dump cars.

The "Plymouth" pulling a train of ten loaded cars, 1½ yd. capacity, in yards of E. Biglow Co.

Why Not for YOU?

If Fleigle, Fredonia, Biglow and scores of other clayworkers find the "Plymouth" the most economical of haulage systems, is it not reasonable to suppose that it will be the same to you? The "Plymouth" is at least worth the while investigating, is it not?

Get the Facts About "The Plymouth"

When you go to the Cleveland conventions why not stop in at Fate Headquarters—Rooms Nos. 330, 332, 334, 336, 343 and 345, Hotel Statler, and let us tell you of actual installations in clay plants where "Plymouths" have worked wonders?

If you do not attend the Cleveland conventions, write us and we'll send you a "Fate Book of Facts", which will give you all the desired information.

USE COUPON For your convenience there is a coupon at the left—fill it out, tear it out and mail it today. Or, if you wish, drop us a post card and the booklet and other information will be forwarded you.

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

(Firm Name)........................
(City) ....
(Street) ....
(State) ....

THE J. D. FATE COMPANY 242 RIGGS AVE. PLYMOUTH, O.

"Ask Fate" About Clay Machinery

At the Cleveland Conventions

The Wise Man of FATE

If you have difficult problems to solve in the manufacture of clay products—

Or, if you contemplate the purchase of new equipment for an old or new plant—

Stop a Fate Free Service Man at the Cleveland conventions (You'll know him by the badge he wears—"Ask Fate") and he'll be at your beck and call.

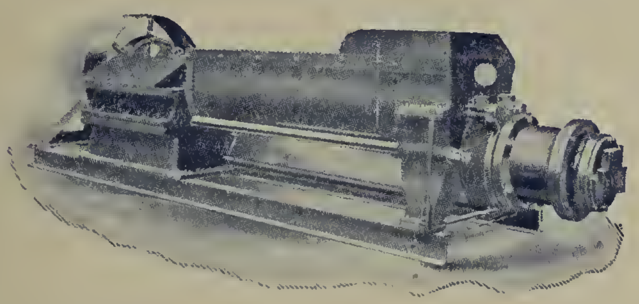
Fate Clay Machinery

Has Solved Many Difficult Problems

Fate machines are not "just machines". Each one has been designed, through progressive stages of many years' practical experience, for specific purposes, and stands alone among all competing machines as the best that inventive genius, time, labor, material and experience can devise.

Get the right Fate machine in the right place and you'll never have to replace it with another make.

We Make Everything The Clayworker Uses



There is nothing in the clay machinery line we do not make—and a machine or devise for every purpose.

We maintain our own foundries—our own machine shops—our assembling rooms—

And at no stage in the manufacture of Fate Clay Machinery do we entrust any portion of the work to outside hands.

"ASK FATE"

At Cleveland or Now

If you go to the Cleveland conventions call at Fate headquarters—Rooms Nos. 330, 332, 334, 336, 343 and 345, Hotel Statler, and let a Fate Free Service Man tell you about the Fate Line of Machinery.

Or, if you wish, check off the items in the little squares in the coupon at the left and put into the mail TODAY. In either case you'll get the best information the Fate Free Service Men can give you—and without obligating yourself in the least.

Let FATE'S Experience Help You

Our experts are at your dsposal on any problems that confront you. Give us a frank statement of the conditions that exist—name your requirements, and let us make you a suggestion.

You will be placed under no obligations to buy—for customer and prospect alike may enjoy the advantages of this Fate Free Service Bureau.

USE COUPON If you do not attend the Cleveland conventions and see a Fate Free Service Man in person, use the little coupon at the right, which is placed there for your convenience. Check off any of the items you are interesied in and a special folder will be mailed you. Ask any questions you may have in mind on a separate sheet of paper and we will gladly give you the information.

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, Ohio.

We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner

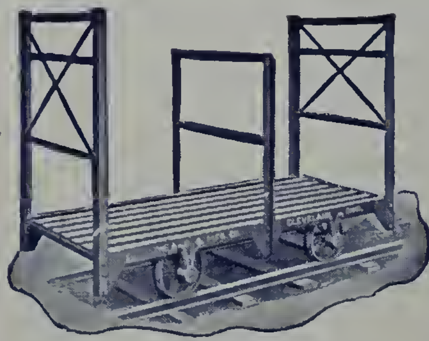
☐ Auger Brick Machinery
☐ Hollow Ware Machinery
☐ Disintegrators
☐ Conveyors
☐ Drain Tile Machinery
☐ Full Equipment
☐ Industrial Locomotives
☐ Clay Feeders
☐ Pug Mills
☐ Crushers
☐ Elevators
☐ Clay Testing

Name..

Town.............................. .... State........

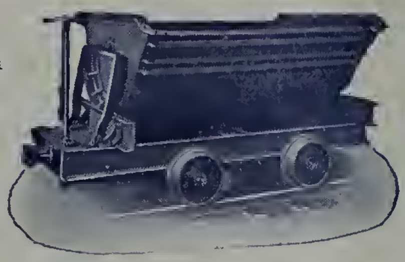
THE J. D. FATE CO., 242 Riggs Avenue
Plymouth, Ohio

See our advertisement on page 205.



No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment



Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives

Storage Battery Locomotive for general use.

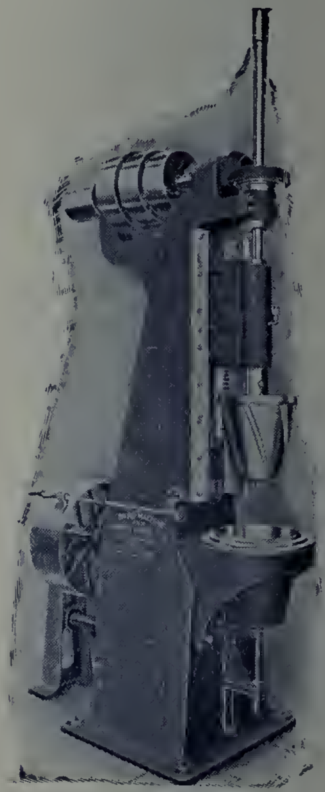
will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information



Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

LAKEWOOD NO. 166

Dryer Cars
Rack Cars
Dump Cars

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

Chicago: 506 S. Canal St.
Pittsburgh: 1230 Fulton Bldg.
New York: 30 Church St., Room 802.
Baltimore: Munsey Bldg.
Kansas City: N. Y. Life Bldg.

OF THE
UNIVERSITY OF ILLINOIS

MARCH, 1916

THE CLAY-WORKER

OFFICIAL REPORT

30TH N·B·M·A· CONVENTION

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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BUYERS' READY REFERENCE LIST
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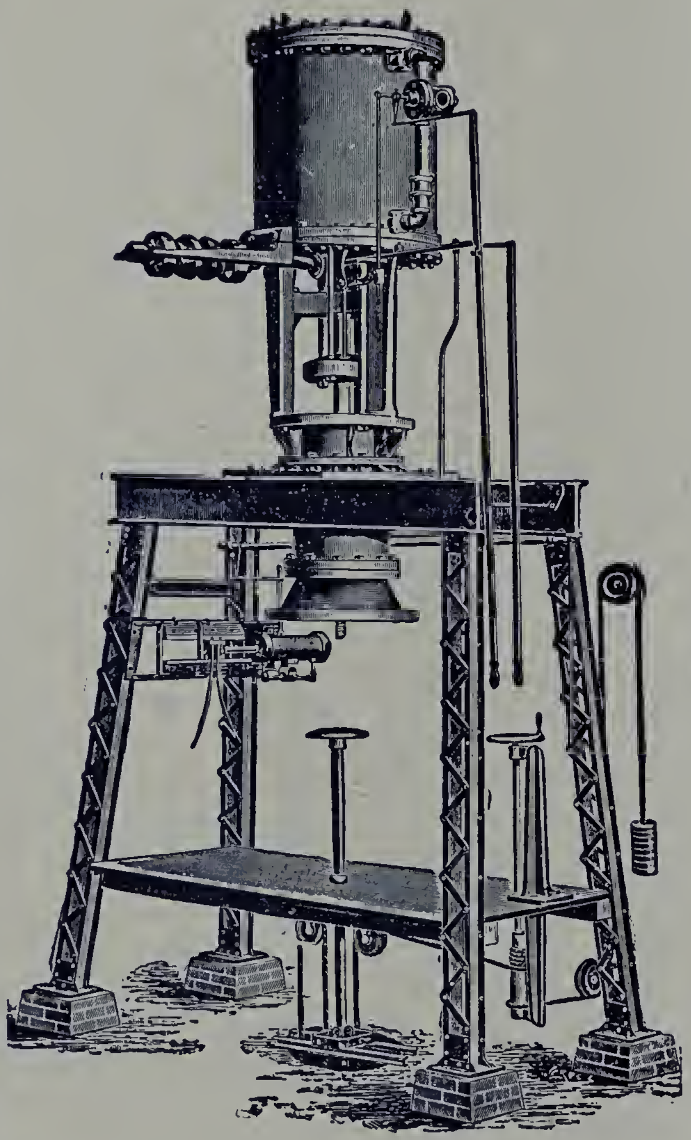
All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.

ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC. Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.



We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

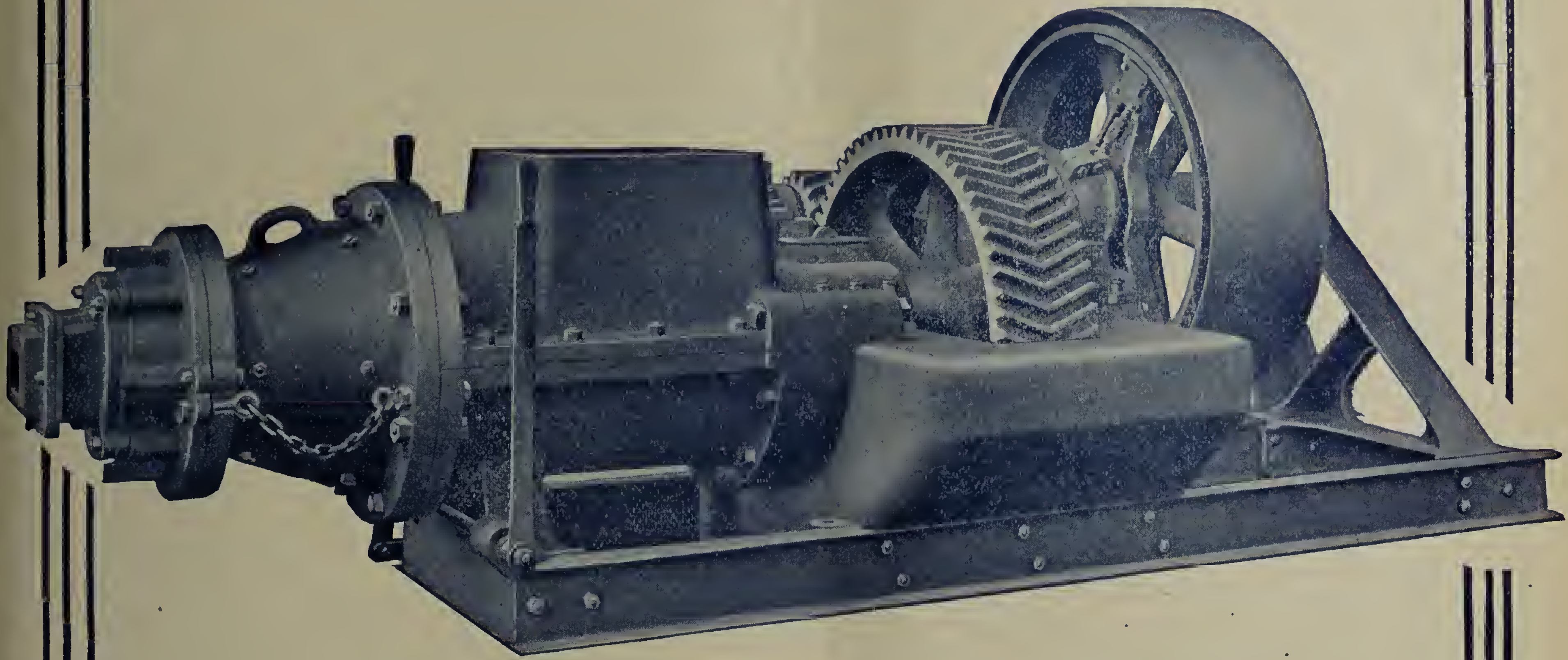
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.

THE BONNOT COMPANY

CANTON, OHIO

909 N. Y. Life Bldg.
KANSAS CITY, MO.

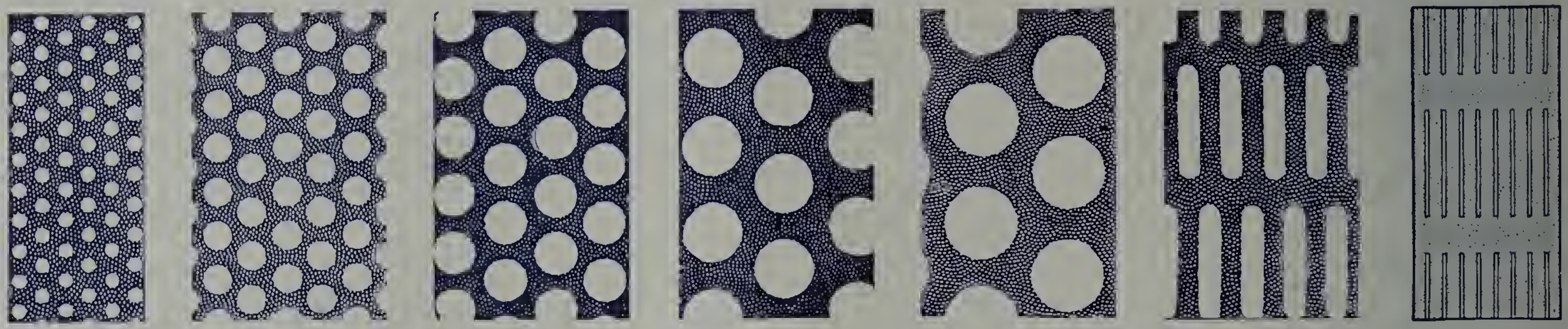
211 Higgins Bldg.
LOS ANGELES, CAL.

See our advertisement on page 387.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

Prepare for a Busy Season and a Labor Famine!

Make Yourself Independent of Your Wheeling Gang When the Rush Comes.

BARKWILL BRICK CO. PLANT, CLEVELAND, OHIO, SHOWING THE MATHEWS GRAVITY BRICK CONVEYER.

Don't wait until you are in trouble before you order an outfit of Mathews Gravity Conveyers. You cannot expect us to have a system to fit your requirements all made up ready to ship the day you order it, no matter how badly you need it. We always have orders ahead of yours, and we need time—sometimes several weeks—to catch up with an accumulation of unfilled orders. Ask us now to send the nearest representative. He will tell you what you need, the cost, and get the order on file without waste of valuable time.

Branch Factories:
TORONTO, ONT.
LONDON, ENG.

MATHEWS GRAVITY CARRIER CO.
ELLWOOD CITY, PA.

RODGERS

JUST SO MUCH FOR SO MUCH---
AND NO MORE---

has never been our policy.

WE GIVE of our service until you GET satisfaction.

Nor is our equipment of the JUST SO MUCH FOR SO MUCH type.

When a Clay Products Manufacturer signs a contract with us, for a

RODGERS WASTE HEAT DRYER,

he can depend upon getting ALL he will require in the way of equipment—the BEST POSSIBLE TO BUILD—and ALL the attention necessary to the satisfactory working out of his proposition.

We never give

JUST SO MUCH FOR SO MUCH---
AND NO MORE.

L. E. RODGERS ENGINEERING CO.

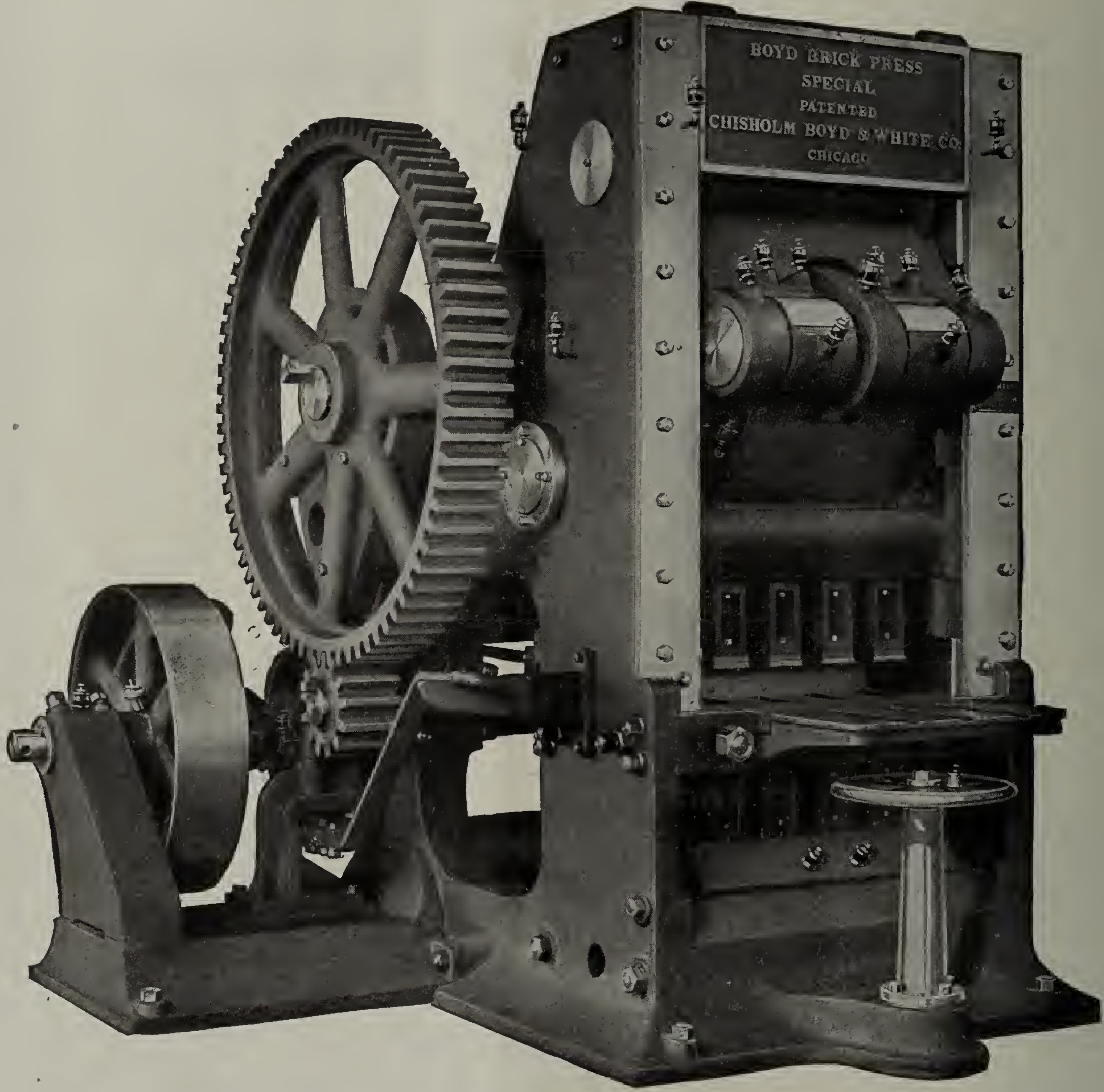
Waste Heat Dryer Specialists
Brick Works Engineers
Largest Manufacturers of Brick Drying Equipment in the United States
General Offices and Works

O
H ZANESVILLE, I
O

RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

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To Find Any Particular Firm or Advertisement See "Index to Ads" as Cited on Front Cover Page.

Ammeters.
The Brown Instrument Co.

Analysists and Chemists.
Ceramic Supply & Con. Co.
N. J. State University.

Arch Cutting Apparatus.
Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.
Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.
(See Cutting Tables.)

Barrows and Trucks.
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Anderson Fdy. & Mach. Works.
Bonnot Co., The
H. Brewer & Co.
Carnell, Geo.
Chambers Bros. Co.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.
Roessler-Hasslacher Chem. Co.

Bearings, Roller.
(See Supplies.)

Belting.
Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.
American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Blowers.
American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.
American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.

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Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).
Parker-Russell M. & M. Co.

Brick (Paving).
Alton Brick Co.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
Mayer Brick Co., C. P.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.
American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.
American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Mchy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Fernholtz Brick Machy. Co.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Soft Mud).
American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Martin Brick Mch. Mfg. Co., H.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).
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Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Dry Press).
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
Fernholtz Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.
International Clay Mach. Co.

Brick Setting Machinery.
American Clay Machinery Co.

Buffing Machinery.
American Clay Machinery Co.

Burning and Drying Systems.
American Clay Machinery Co.
American Blower Co.
Boss, John C.
F. W. Dennis.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.
(See Dryer and Dumping Cars.)

Carbide Coating.
Stowell, E. R.

Castings.
American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Clay Crushers and Pulverizers.
American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Phillips & McLaren Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clays.
American Clay Machinery Co.

Clay Dryers.
American Process Co.
Schaffer Eng. & Equip. Co.

Clay Feeders and Mixers.
American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.
(See Scrapers.)

Clay Steamers.
American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.
American Clay Machinery Co.
Fate Co., The J. D.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.
(See Supplies.)

Coloring Materials.
Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.
Orton, Edward, Jr.

Consultnig Engineers.
Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.
American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.
American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.
Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Couplings.
(See Supplies.)

Cutting Tables (Brick & Tile).
American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.
American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.
(See Supplies.)

Dies.
(See Supplies.)

Disintegrators.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
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Drills.
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Drain Tile Machinery.
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Standard Dry Kiln Co., The
Steele & Sons, J. C.
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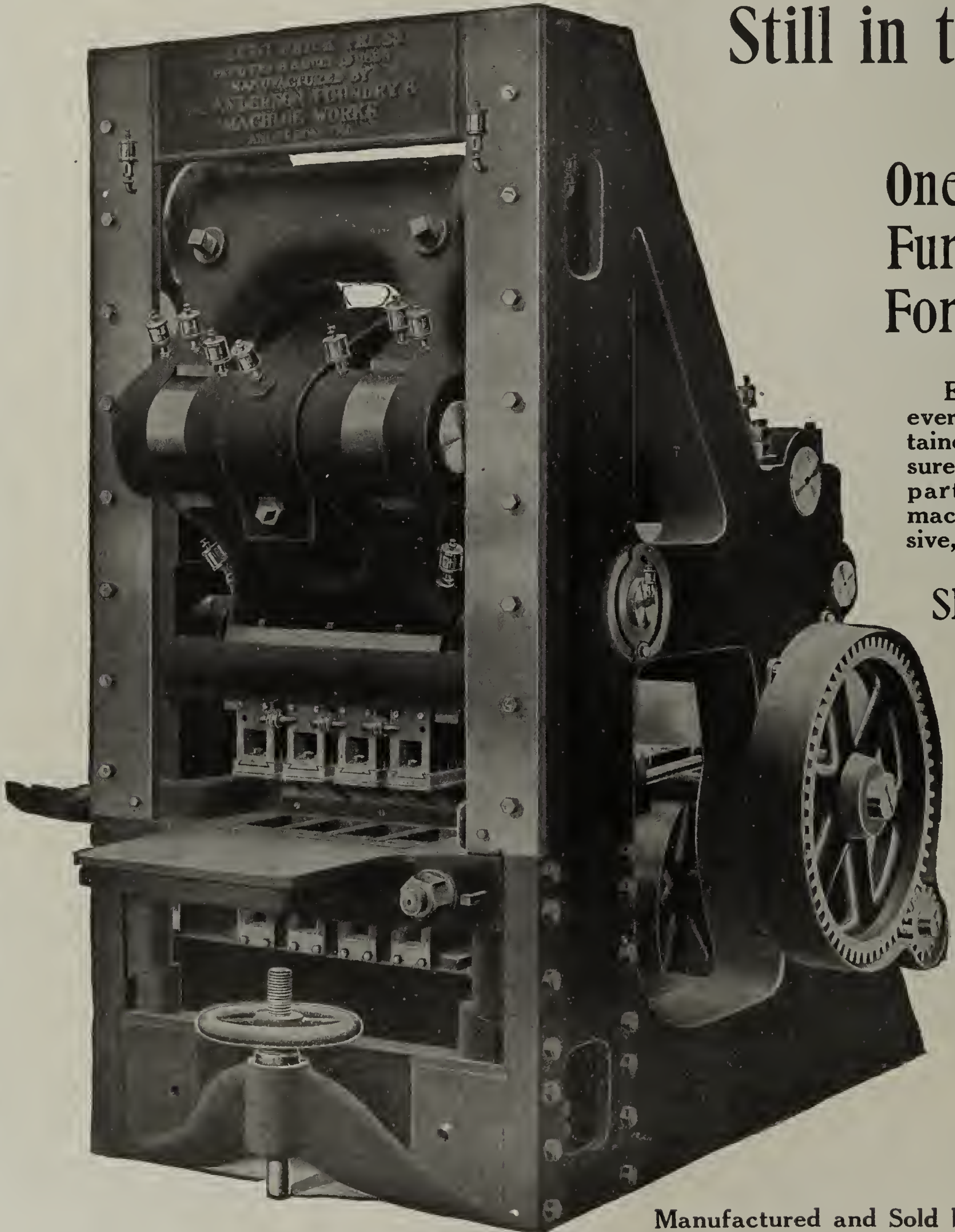

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Freese & Co., E. M.
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Steele & Sons, J. C.
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Brown Instrument Co., The
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Jacks.

(See Supplies.)

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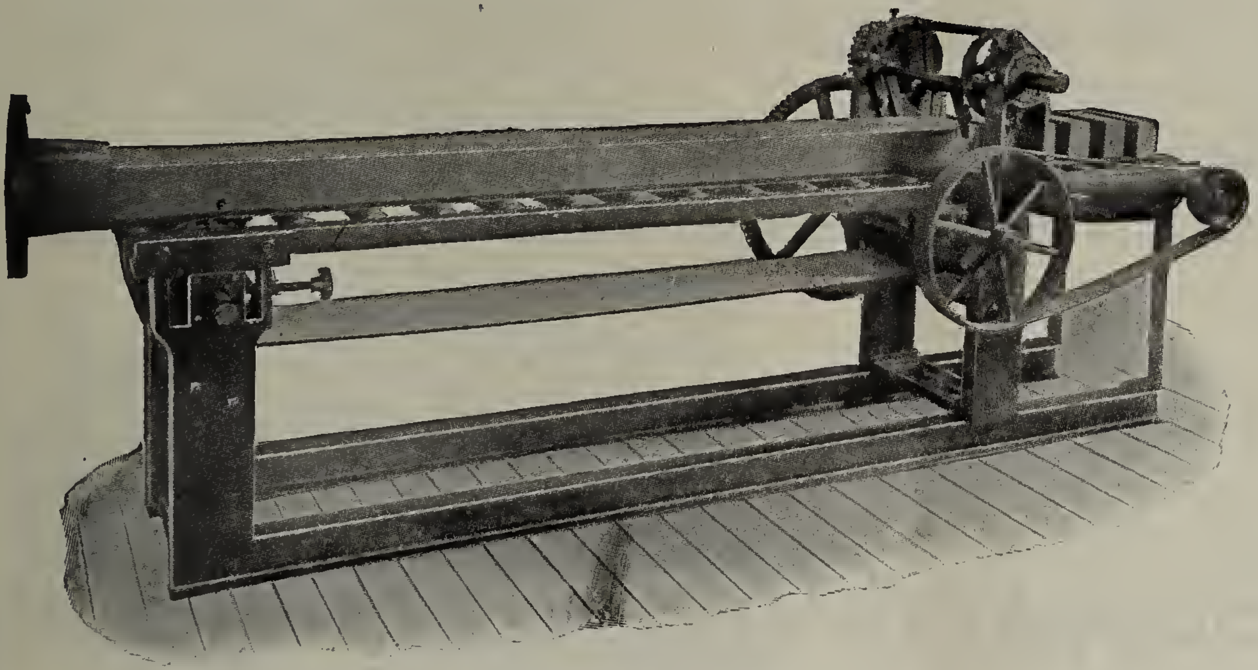

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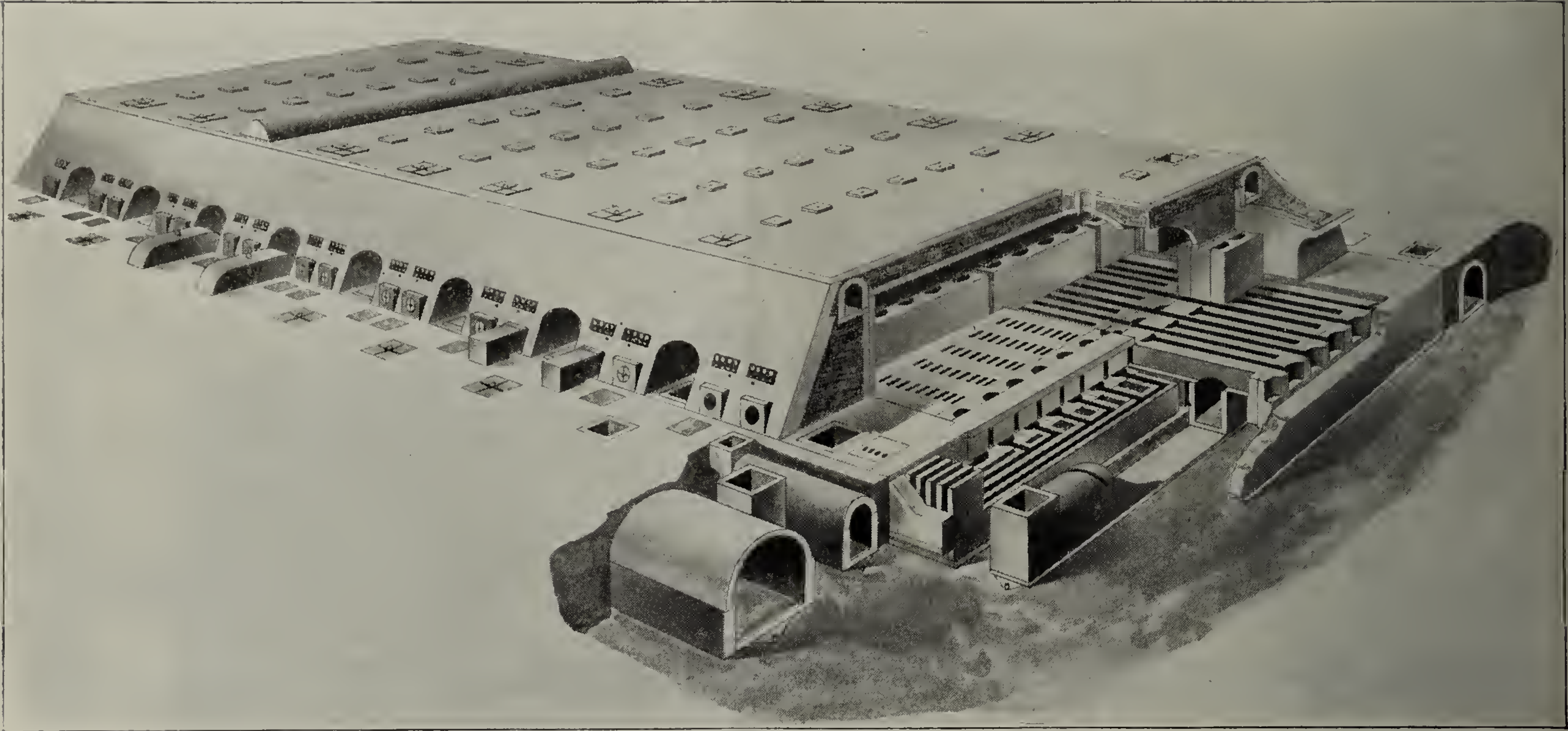

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Smith Co., Claude.
Swift, Edward A.
Yates, Alfred

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(See Supplies.)

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(See Supplies.)

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Trautwein Dryer & Engr. Co.

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Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
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Fate Co., The J. D.
Freese & Co., E. M.
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(See Supplies.)

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(Continued on page 260.)

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(See Supplies.)

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Sewer Pipe Machinery.

American Clay Machinery Co.
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Taplin-Rice-Clerkin Co.

Steam Gauges.

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Steam Specialties.

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Carnell, Geo.
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Chambers Bros. Co.
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Chisholm, Boyd & White.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
Hensley, J. W.
International Clay Mach. Co.
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By Ellis Lovejoy.

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Scumming and Efflorescence.

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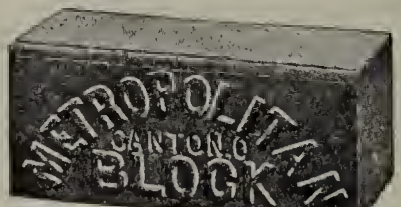

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Are manufacturers of repressed vitrified shale paving brick of unquestioned merit and also licensees of DUNN'S Wire-Cut-Lug Block, which is the acme of perfection for street paving material.

Write us for samples and prices.

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Clinton, Indiana

C. P. MAYER BRICK CO.

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The MAYER BLOCK is Unequaled in Abrasion Test.

The Louisville Machine Co.

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Dies for Clayworking our Specialty.

Brick, Fireproofing, plain and ornamental Hollow Ware Dies, for auger or steam press. Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

PATENTEES OF

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PURINGTON PAVERS

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GALESBURG SHALE

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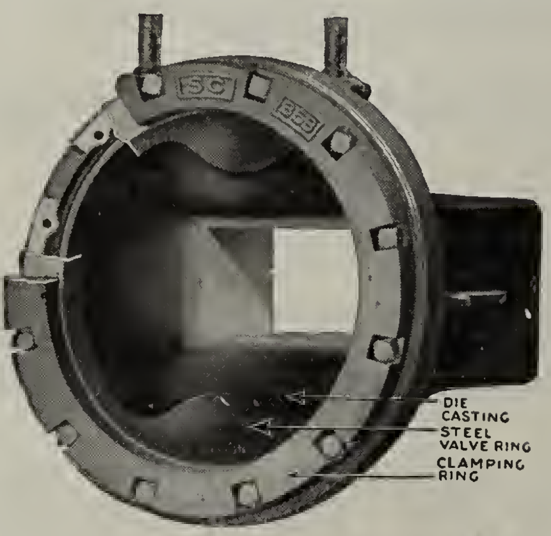
GALESBURG, ILL.

Chambers Brothers Co., Philadelphia, Pa.

Brickmaking Machines and Appliances of the Better Kind.

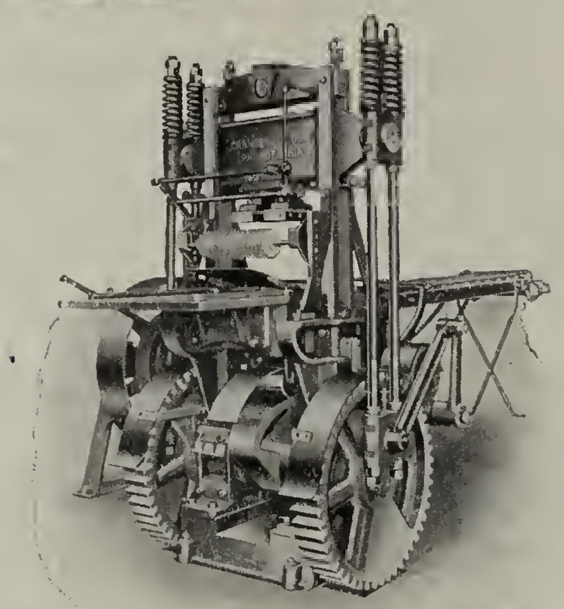


The Chambers Lubricating Die Helps on the Rattler Test.

The lubricant is applied at the point of greatest resistance and is forced into the die under pressure. Contributes to a more uniform movement of clay bar. Gritty shales and fire clays possessing but little plasticity are molded more succesfully with this die. Less power, less waste, better product. Used on various auger machines. Both side and end cut.

Lubricating Side-Cut Brick Die.

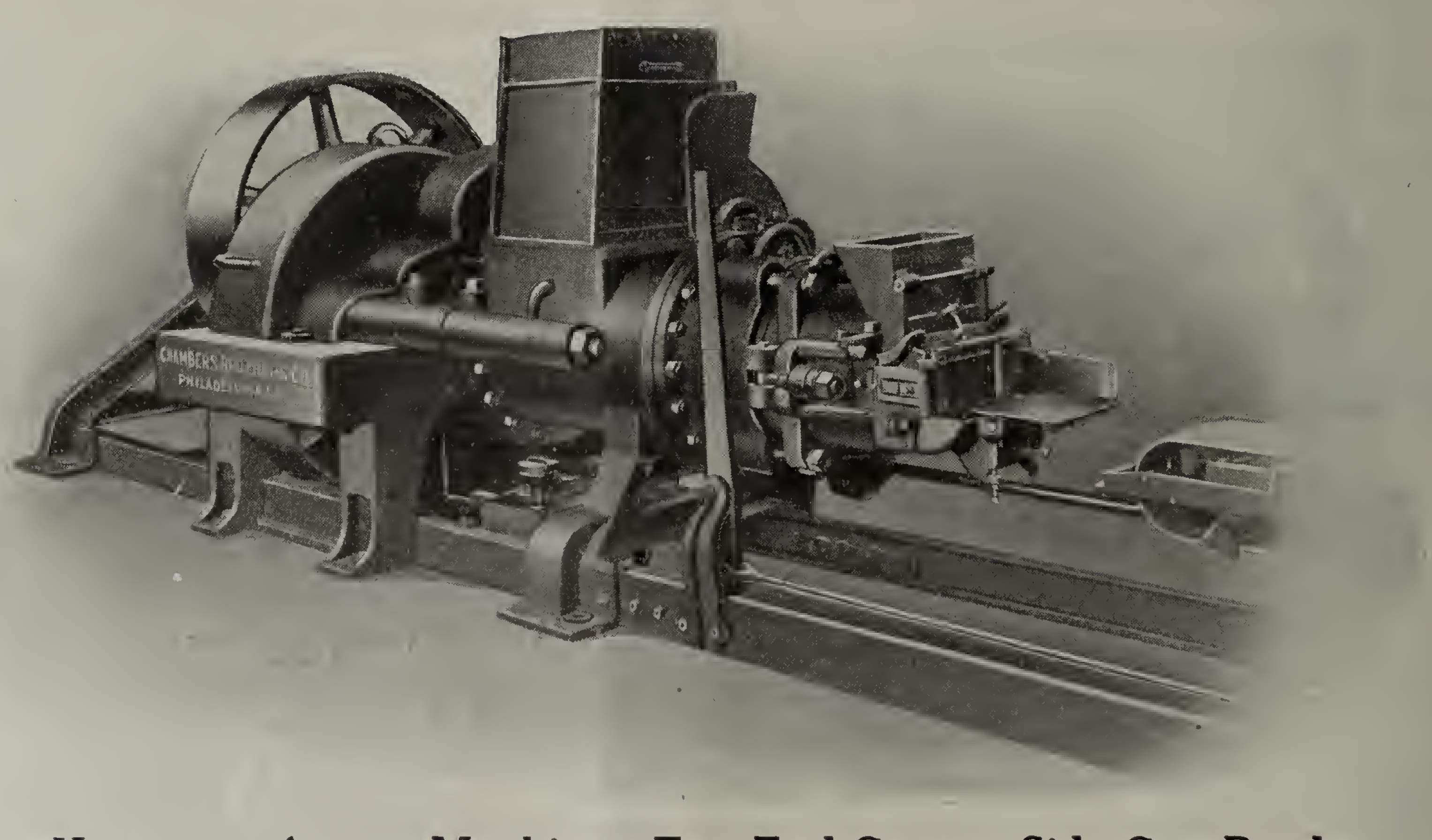
(Patented Feb. 24, 1903.)



THE KEYSTONE REPRESS

A strongly built Crank Press that has found favor with manufacturers of fire brick and furnace blocks. Closely built, with great stiffness in crank shaft.

All cross head slides of liberal dimensions. The feed mechanism is in perfect time and gives a smooth, easy movement to the finished product. Press built in four sizes for different classes of work.

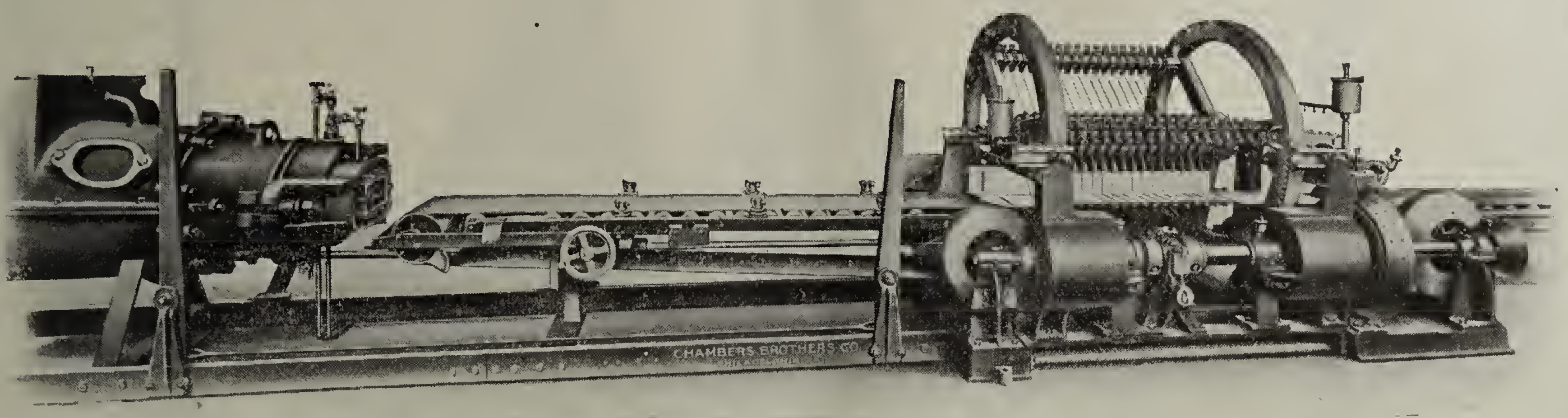


The Keystone Auger Machine---For End-Cut or Side-Cut Products.

Of great strength and large capacity. Single gear type. Gearing enclosed and running in oil. Journals lubricated by circulating oil system.

Chambers Brothers Co., Philadelphia, Pa.

Clayworking Machinery Developed
Through a Careful Consideration of the Criticisms of
Experienced Brick Manufacturers.



THE BRICK CUTTER THAT DOES NOT SWELL THE CLAY-BAR

Built so far as possible, to a standard for the construction of machinery of this class.

We Refer by Permission to

The Mill Hall Brick Works	Mill Hall, Pa.
The Reynoldsville Brick and Tile Co.,	Reynoldsville, Pa.
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Shipments Are Now Being Prepared for

The El Paso Brick Co	El Paso, Texas
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The National Fire Proofing Co.,	Port Murray Works, N. J.
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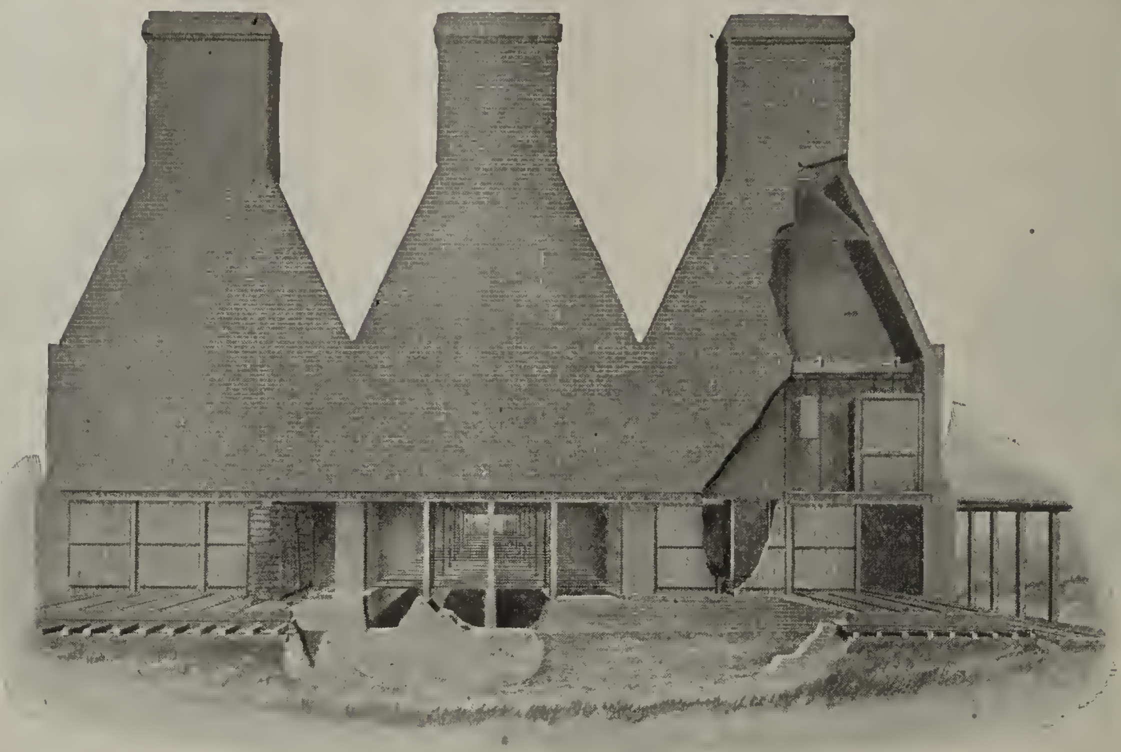
The Kier Fire Brick Co.	Pittsburgh, Pa.
Darlington Clay Products Co.	Darlington, Pa.

*These Are All Well Known Concerns Whose Managers
Investigated and Then Selected The*

Chambers Multiple Brick Cutter No. 10

"O. K. for Every Clay"



No Mystery

about brick drying. No "secret processes." The three drying agents---heat, humidity and circulation of air---must be capable of being separately controlled, in order to secure the correct drying conditions for the particular variety of clay you have to dry.

That's all. Get *perfect control* and you get satisfactory results. That's why so many brick manufacturers have installed

The Standard Drier

---the drier in which *all* the drying elements are *always* under control. Write for the catalog. Address: The Standard Dry Kiln Co., 1547 McCarty St., Indianapolis, Ind.

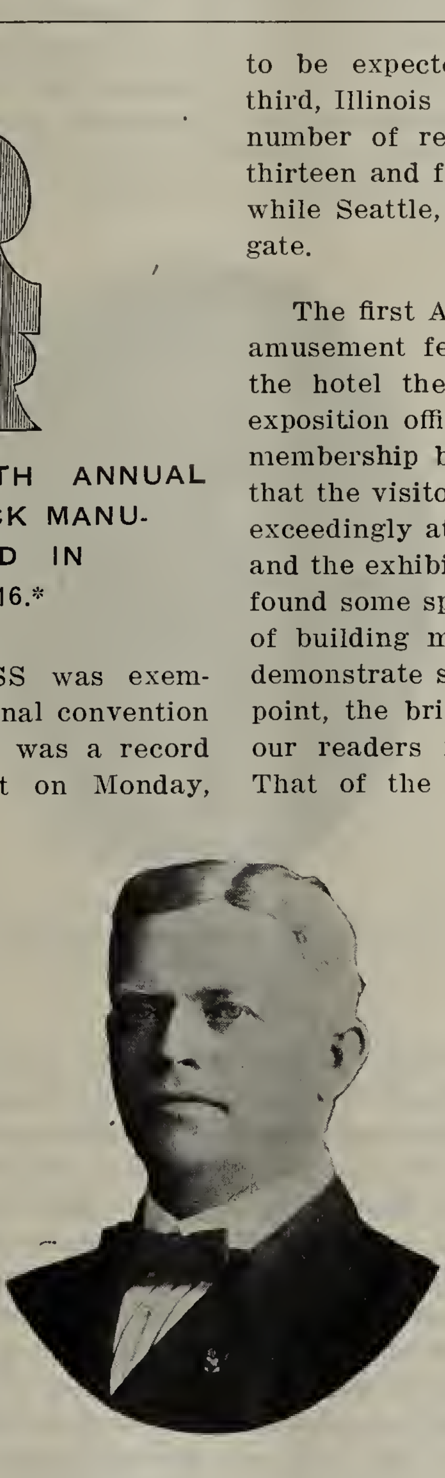
THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXV. INDIANAPOLIS, IND., MARCH, 1916. No. 3

OFFICIAL REPORT OF THE THIRTIETH ANNUAL CONVENTION OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION, HELD IN CLEVELAND, O., FEB. 21 TO 26, 1916.*

THE IMPORTANCE OF PREPAREDNESS was exemplified in a very forceful way at the national convention at Cleveland. As was anticipated, there was a record breaking attendance. The crowd was great on Monday, and on Tuesday and Wednesday, it became a crush. For hours at a time, there was a line of delegates nearly a half block long waiting to register, and many had to be turned away and seek accommodations elsewhere. Those who had come prepared with advance reservations tucked away in their inside pocket, were promptly and comfortably cared for. Of course, in such a congestion there were exceptions due to clerical errors, which will happen even in the best of regulated hotels, but the Statler executive force proved exceptionally efficient under the tremendous stress, and a very large majority of the delegates were made happy promptly on arrival. The few exceptions but emphasize the importance of preparedness, hence it is safe to predict that the careless ones will not again trust to luck when convention time comes once more.



President C. P. Mayer,
Bridgeville, Pa.

The Association banners were flung to the breeze early Monday and by noontime the immense lobby of the Statler was thronged with bebadged visitors, and the number grew and grew until it was really difficult for one to get about. One of the Statler officials said that in fifteen years' experience, he had never seen a hotel so crowded.

The delegates were a representative body, well groomed and prosperous in appearance. Thirty states were represented. Of course, Ohio led in the number of delegates, as was to be expected. Pennsylvania ranked second, New York third, Illinois fourth, Indiana fifth, and Michigan sixth, in the number of registrations. Canada had a live delegation of thirteen and far away Los Angeles had three representatives, while Seattle, Spokane, Helena and Butte each had one delegate.

The Complete Building Show.

The first American Complete Building Show was the chief amusement feature, and being but a block and a half from the hotel the delegates made frequent trips thereto. The exposition officials had thoughtfully and generously made the membership badge the open sesame to the show, a courtesy that the visitors appreciated immensely. The show itself was exceedingly attractive. Every bit of display space was taken and the exhibits were so varied in character that every visitor found some special feature of particular interest. All manner of building materials was on display, each line striving to demonstrate some line of superiority. From an artistic viewpoint, the brick displays were easily the most attractive, as our readers may see from the illustrations in this issue. That of the Ohio Face Brick Manufacturers' and Dealers was the most pretentious and challenged the open admiration of every visitor, while the Dutch Kitchen of the Farr Brick Company was the most novel. The display of the National Paving Brick Manufacturers' Association proved very attractive. A stream of visitors studied and admired the miniature brick home and brick paved streets and were impressed with the sanitary quality of vitrified brick for city, town and country highways.

The crowds which daily thronged the show manifested keen interest in home building of all sorts. The prize home appealed particularly to the masses. The lumber dealers vied with the brick and tile interests in the display of miniature buildings prettily grouped and decorated. Interspersed among these chief exhibits were all the various side lines connected with home building and home decoration, so attractive all in all that there was a total attendance registered of over 125,000.

Entertainment Features.

There was no lack of entertainment for visitors from Sunday to Saturday. While there were no formal side trips, many of the delegates visited neighboring brick plants and the factories of clay machinery manufacturers, and between times visited with the latter at their rooms in the hotel where souvenirs of various sorts were distributed. The ladies were entertained at luncheons, card parties and receptions, and a theater party took the place of the Smokerette, the local committee turning the latter into a stag enterainment. The latter was a lively combination of vaudeville stunts, musical numbers and luncheon, which in its jollity reminded old timers of the "pow-wows" of early days. It was the most numerously attended of any of the functions, the crowd over-flowing into the galleries of the immense ballroom. The annual banquet was a delightful occasion, surpassing the expectation of the guests, as our readers will see when they read the full report of same which will be given as usual. So well pleased were the guests that they were reluctant to have Toastmaster Deckman say the final word, but seemed to want to continue the revelry. Indeed, some of the younger members proceeded to do so. The rugs were removed and dancing was indulged in to the music of Secretary Randall's graphonola, presented to him during the first session.

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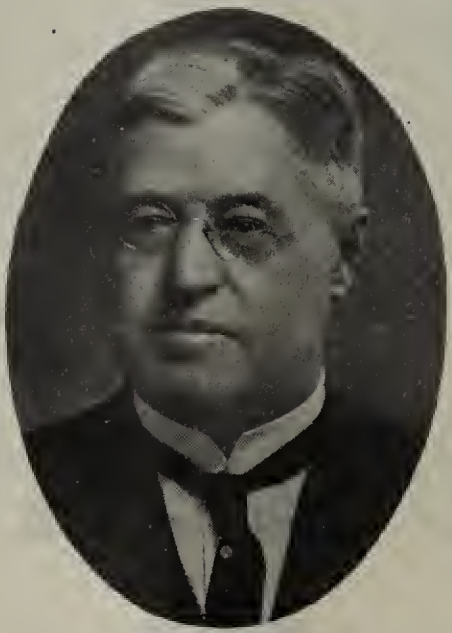
Badges and Decorations.

There was a surfeit of badges and other decorations. For the first time in a number of years the American Ceramic Society indulged in a membership badge, a very pretty combination of blue and oxidized silver. The Complete Building Show officials presented exhibitors with an appropriate badge in copper bronze, and the N. B. M. A. delegate and guest badges were unusually pretty, and appropriate, being a combination of the official colors of blue and gray, designed by the local committee and presented by them as a souvenir of the convention. The bar contained the number designation and the ribbon bore the monogram of the Association. The badge when removed from the ribbon can be used as a pocket piece, the back containing a mirror instead of the usual ad of the manufacturer. Members not attending will be supplied with the badge on request.

First Vice-President Fritz Salmen, Slidell, La.



President-elect Charles J. Deckman, Cleveland, Ohio.

Second Vice-President George H. Clippert, Detroit, Mich.

FIRST SESSION.

Cleveland, O., February 23, 2:30 P. M., 1916.

President Mayer: Ladies and Gentlemen—The thirtieth annual convention of the National Brick Manufacturers' Association will now come to order. According to our usual custom we will open the convention with prayer. The Rev. L. F. Ruf, of Cleveland, Ohio, is present for the purpose. You will please rise.

The Opening Prayer.

Rev. R. L. Ruf: Almighty God, our heavenly Father, we thank Thee that we can invoke Thy presence and guidance and direction in all the things of life with which we have to do; and as we discharge our obligations and are faithful in business, we are promoting Thy word and Thy law. We beseech Thy blessing upon this gathering of men who have come together to see how they can promote their business. May they always seek to promote righteousness and do Thy work. Wilt Thou take them and all those dear to them into Thy keeping, and so love and direct us as we discharge our affairs of life so we may give our account to Thee at the end without shame and without regret. Take unto Thy protection those away from home and return them safely again, if it be Thy holy and gracious will, and bring us all at last, we beseech Thee, to the home Thou hast prepared for Thy children through Jesus Christ, our Lord, Amen.

President Mayer: I would like to have Vice Presidents Deckman and Clippert come forward and take seats on the platform.

Secretary Randall: I really believe Vice President Deckman hates to leave the side of ex-President Crook, who is here for the first time in several years, and inasmuch as Mr. Crook is an ex-president of this Association and was ill the year he was elected and so did not preside over the convention, I think it would be very nice for Charlie Crook to keep Mr. Deckman company. He is shy one or two meetings anyway. (Applause.)

President Mayer: The first thing on the program is an address of welcome which was to have been made by his honor, the mayor of Cleveland, but by reason of illness, he is unable to be here, and I am pleased to introduce at this time Floyd Waite, assistant director of public service of Cleveland. (Applause.)

Welcome to the City of Cleveland.

Floyd E. Waite: Ladies and Gentlemen—I know as well as you do that nothing I can say, or no matter how I may look, will satisfy you. Inasmuch as the mayor could not be here, however, there is a double significance in my appearing here today. It is indeed a deep honor that has been conferred upon me, for the reason that the first invitation that was issued to the National Brick Manufacturers' Association to hold their convention in Cleveland was issued to you in your convention during a speech I made there last year. You will remember we had some competition last year and Cincinnati and Atlantic City and St. Louis and other well-known cities throughout the country, but I told you if you would come to Cleveland, we would use every effort in our power both through the sources of government and good fellowship to give you the best treatment possible. Now we are more than delighted to have you here. I speak not only for the city, but for the great commercial interests of our city. I know I am voicing their sentiments when I say I am delighted to have you with us. I remember in that meeting of your executive committee held in this very hotel the question of whether or not you should come to Cleveland was taken up and very earnestly discussed, and I remember at that time I made a talk in favor of this dear old city of ours, and so I feel I have had some part in getting this great convention to our city.

Since I spoke to you at Detroit, I have perhaps fallen into evil ways, and have got into politics. I am no longer able to go about the country and talk to you about the necessity of manufacturing and selling lots of brick in order to cut down fire waste, but I am doing everything I can in my humble capacity as an officeholder in Cleveland to carry on that good work. We intend to give to Cleveland miles more of good honest paved streets. We are going to use all the money we can get hold of for that purpose, for this administration believes most seriously in preparing good brick highways for the people. It has been one of the great works of past years to build good roads, and I am glad I am associated now with the city administration and it will continue to do this same kind of work. You will remember I said to you in your meeting at Detroit in order to offset the argument that had been made by the gentleman from Cincinnati, who told you if you came to Cincinnati that the city would be open to you until twelve o'clock at night, and I replied that if you came to Cleveland we would keep the city open all night. Now in case some of you will take advantage of that invitation, or in case some of you should take me too literally in the promise I made at Detroit, I will say now the mayor has thought it very fitting to send here a representative who would be able to look after you in case you do get into that kind of a disadvantage and perchance some evil should befall you and you should be taken into custody and when morning came you could not find Mr. Mayer or Mr. Randall or Mr. Deckman or Mr. Blair to furnish you bail and you had to go out to our farm, you would find a gentleman who would talk to you nicely and for that reason the mayor has sent him up here so you could get acquainted with him. (Applause.)

So I want to say in conclusion Cleveland feels honored by this convention coming today. We have over here on another street a great building show, one of the most remarkable exhibits in the history of this nation or any other. We have done everything we can to make you happy and contented and the city of Cleveland feels just the same as the men you have met here who have welcomed you to our city. I hope you will have the best time you can have. I had a dandy time in Detroit last year. I hope you will get in touch with our big business enthusiasm and interests and I hope when you go away you will feel like thousands of others who have visited Cleveland, that our city is one of the finest and best in the whole dominion. I thank you. (Loud applause.)

President Mayer: It is now my privilege and pleasure to introduce to you Mr. Lemar T. Beeman, director of public welfare of the city of Cleveland. From the construction Mr. Waite put upon it it must be something pretty good.

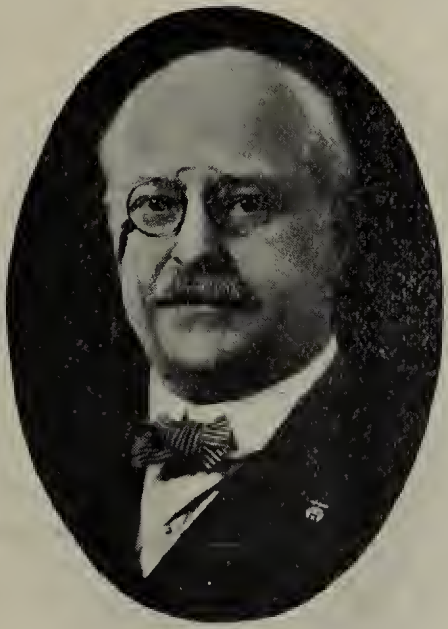
Mr. Beeman Speaks for the Mayor.

Lemar T. Beeman: Ladies and Gentlemen of the National Brick Manufacturers' Association—I come to you this afternoon to welcome you to the metropolis of Ohio on behalf of his honor the mayor. It is a matter of deep regret to him that his physician has commanded that he discontinue public talking for a few days to come. He has done so much of this and gone in person to so many conventions and evening affairs of the city that his physician warned him a week ago of the results and yesterday commanded him to discontinue all extra work for some few days. So as best I can I represent him and bring to you his message of a most cordial welcome to the Ohio metropolis, the most pleasant wish that you may enjoy your sessions here and find profit as well as pleasure in your deliberations together.

It is the mayor's wish that I make a sort of apology to you that the city of Cleveland has no better or larger building in which to hold the exposition that is now in progress and to say to you that he hopes you will come to Cleveland again in the next few years and that on that occasion you will find in this city an auditorium second to none in the United States. He has always taken the initiative toward the building of such a structure and he hopes your organization will be one of the first that will take advantage of it and profit by it.

The making of brick is a very interesting occupation to one totally ignorant of all the details as I am. Back in the dawn of civilization man made brick and some of the least intelligent of men today are making brick, but in the manufacture of brick even the most casual observer can see these changes which the latter part of the nineteenth and early part of the twentieth century have brought. The making of brick as you gentlemen make it is just as different from the adobe brick in the warm regions of the southwest or the brick of ancient times as any two things can be different. Writing at the beginning of the nineteenth century Von Humboldt said

Third Vice-President J. W. Robb, Clinton, Ind.



Secretary Theo. A. Randall, Indianapolis, Ind.

Treasurer John W. Sibley, Birmingham, Ala.

in his famous works, and Von Humboldt was one of the great men of his time, "It is utterly inconceivable that the nineteenth century should bring to the great human family anything like the progress of the eighteenth." Von Humboldt wrote that book on a parchment sheet with a quill pen by the light of a tallow candle. We all know that the progress of the nineteenth century has already been so incomparably greater than that of the eighteenth century that not even Von Humboldt could ever possibly have foretold it and that progress continues to go on. We know in the future of the brick making business there is destined to be the same progress there has been in the past. You gentlemen engaged in a great field of work like this, making your fortunes and giving your efforts to making of brick are also building civilization. The more our cities and our roads are builded of substantial material in a fire-proofing way, the less the tremendous loss from fires that is a tax on civilization and the easier it is for one district to connect with another; the smaller becomes each county and each state. Twenty years ago, if we went out ten miles in the country or twenty miles we were taking quite a little trip. Now an afternoon ride by machine of a hundred miles is only a pleasure ride, and the result of that changed condition is mutual understanding, a better feeling and more fellowship. Why those great calamities, like the civil war for instance, would have been less probable with paved roads and automobiles by which one section could go to and get acquainted with another. The isolation of mankind, the artificial walls that are built are the things that make national hatred and warfare with its awful loss of civilization and the sorrow of individuals.

Floyd E. Waite, Cleveland, Ohio.

Lawrence Koblitz, Cleveland, Ohio.

H. C. Kleymeyer, Evansville, Ind.

In the betterment of civilization, in the advance of this world, you gentlemen who are giving your energies to the making of brick are doing your share to make civilization better and mankind happier and so to you in this work I close by repeating that I present to you the freedom of the city. I hope you may enjoy your stay here and that you may come again and I say it on behalf of his honor, Mayor Harry L. Davis. (Loud applause.)

President Mayer: It is now my privilege to introduce to you H. C. Kleymeyer, of Evansville, Ind., who will respond to these cordial addresses of welcome. (Applause.)

Response to Address of Welcome.

Mr. Chairman, Mr. Waite, Mr. Beeman, Ladies and Gentlemen:

In behalf of the National Brick Manufacturers' Association, I wish to thank the representative of the mayor for his kindly words of welcome.

I believe I speak for all of our members when I say that we have been looking forward with great anticipation to this meeting in Cleveland, the sixth city in the United States. We have heard so many praises for the beautiful city on Lake Erie that we thought we would come, and see for ourselves.

A city which has given to the world so many men like John D. Rockefeller, Mark Hanna, Tom Johnson, and our own Charlie Deckman, will never be able to hide its light under a bushel. A city which has made its influence felt from one end of the country to the other, in political life, in commerce, in science and manufacture is bound to win our admiration and esteem.

Cleveland has been paving the way to this big gathering for some time; first, by constructing many miles of the best paved streets and country roadways; second, by organizing the Society Advocating Fire Elimination, and finally, to cap the climax, and make this an especially eventful occasion, they have developed a great building show for us to visit, and take a part in as exhibitors as well.

Also, during the past few years the brick manufacturers of Cleveland have been giving some splendid examples of brick boosting that should make anyone interested in the welfare of the brick industry desire to come to Cleveland, meet with these people and see what they have been doing. For they have set a shining example to the rest of the country in advertising brick, the best building material on earth.

It is perhaps fitting to briefly outline the nature and extent of the industry represented by our association, the delegates of which you are bidding welcome to Cleveland.

The industry of clayworking and brickmaking is practically as old as the human race, and as widely distributed as civilization. We take from the earth the common, widespread product of clay and shale and by working and moulding and burning it, turn it into a building material second to none.

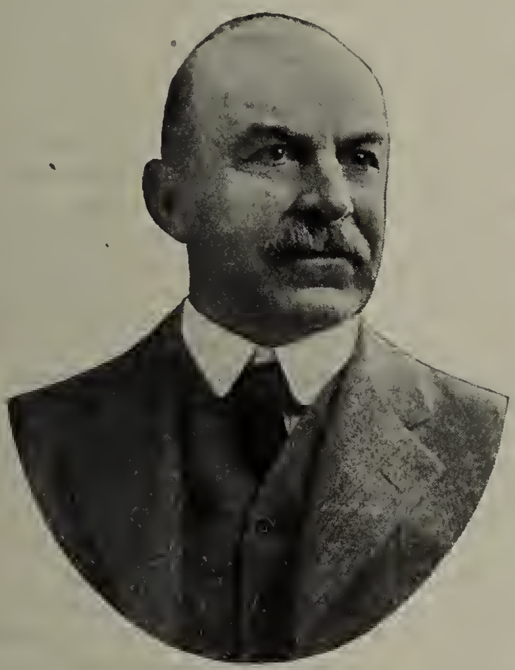
Just as the common or average man in the aggregate is the biggest item in a nation of people and the mainstay of the nation, so is the common brick the big item in this wonderful clayworking industry. Common brick, even though it sells at a very low value, furnishes a total annual product of approximately $50,000,000 at the kiln.

There is much which might be said about this clayworking industry represented by the association delegates, much that might be said historically, because it is one of the oldest industries in the world; much that might be said of it technically, because it involves much scientific research and technical knowledge and skill, and there is a lot which might be said about it commercially, because in a way it offers some of the greatest possibilities in the world for development, if the people of the country can once be properly impressed, not only with the value of burned clay as a building material, but with the fact that it does not require riches to own a brick home.

There is one point, however, that should be impressed a little about our association and its work. Heretofore, we have confined association activities largely to technical research and to the development of the manufacturing end of the business. Of late, however, we have been turning somewhat toward the commercial end. Realizing that to keep the manufacturing end in a healthy and growing condition, we must also develop the commercial end of the business and create a larger demand for the product. That, too, is one of the things which makes it peculiarly appropriate for us to meet here in Cleveland this year. Cleveland has not only been a brick-boosting city, leading the rest of the country in brick paving, and also setting a shining example in the exploitation of building brick, but to encourage and develop the building idea among the people of the country, Cleveland has developed the greatest complete building show ever held and all of this has direct bearing on the new phase of our association work, that is developing the commercial end of the business.

Therefore, we are not only glad to be here, but somehow feel that the result of this convention and this visit to Cleveland should prove profitable as well as pleasant, and that from here shall radiate new ideas and forces which shall stimulate and increase the use of the building material which has stood the test of time, the test of flood and frost and fire. "Build with Brick," "Buy Farr the Best."

I thank you. (Applause.)



R. G. Eisenhart, Horseheads, N. Y.

Eben Rodgers, Alton, Ill.

M. E. Gregory, Corning, N. Y.

Secretary Randall: To relieve our genial and modest president I will announce our next number on the program as being the president's annual address.

THE PRESIDENT'S ANNUAL ADDRESS.

Ladies and Gentlemen:

It is a time-honored and worthy custom for the presiding officer to present to you on the anniversary of his election an annual address or message dealing with matters which he thinks of importance to the clay industries, and I am glad to submit to you today some thoughts which to my mind are of particular importance just at this time.

The one thing uppermost in the minds of everybody these days, it seems, is preparedness. Preparedness as a nation, preparedness in industrial affairs and preparednes as individuals, is desirable that we may solve the problems that come to us in a business way. If the clay industries of the land are prepared to meet the demand for better building materials, an increased era of greater prosperity and activity will come to us as individuals.

To my mind, the work of this association tends directly toward preparedness, for the purpose and object of our annual meeting is not merely to have a good time, though those of us who take an active part in the convention certainly do enjoy ourselves. On that score alone, I think it is well worth while to attend these yearly meetings, but there is something beyond the mere element of pleasure. As a source of widening our vision and knowledge of business affairs, these meetings are of great importance.

I have been impressed with this of late, because I have been looking over the proceedings of former conventions. If every clay-worker in the land would do the same and reread some of the many splendid papers and addresses included in our printed proceedings, I believe they would profit very much. Few of our active members even properly appreciate the importance of our printed proceedings. I am inclined to think that many of us do not give serious thought to the technical papers presented for our consideration as we should. We listen to the papers as they are read, are impressed, applaud the speakers, pass resolutions of thanks, and then forget them.

That, to my mind, is one of the reasons why the association and its officers are sometimes criticised by those who, from lack of knowledge, are not in sympathy with the real purposes, nor do they appreciate the accomplishments of this association. If they knew more about the association, its procedure, and its work, they would be less ready to criticise. Criticism of a friendly sort sometimes is helpful, but when it is whimsical and based on envy or a lack of understanding, it is more apt to be hurtful than otherwise. One of my illustrious predecessors once said in addressing this association, "There is nothing quite so easy as criticism or fault-finding." The great trouble with fault-finders as a rule is they do not look beneath the surface of things—they see the shell, but not the kernel in the shell.

The record of this association is of itself the best answer to these critics. Under the direction of the executive committee, the association has kept its course steadfastly as an educational organization. While there have been attempts to divert it at one time and another, they have not been successful, and we may properly thank our executive officers for their persistence in keeping this organization as it was originally intended, free from personal or trade influence and strife. The good Lord knows there is enough of that element injected into our local affairs, and we do well to keep as far from it as we can in these national gatherings.

Speaking from my own personal experience, and you know this is my fourth year of service as an executive officer, having started in as third vice-president in 1912. I want to say a word of approval of our procedure as relating to the selection of our executive officers. Whoever conceived the idea or plan under which we have been operating for several years, understood the power and influence of continuous effort. Our system of promoting a man from third vice-president on up is most commendable, for it insures more thought and consideration for the welfare of our association than would be possible if an executive officer was chosen to serve a single year, because of some local or temporary influence. I have profited personally by my official connections, and

I think every officer, those who have preceded me and those who are following after, will heartily concur in this judgment.

I was reading in a current magazine an interesting article on "Captains of Industry," in which Mr. Patterson, of Dayton. Ohio, who made such an enviable reputation during the flood calamity which overtook that city, was referred to as a high type of citizen, but as a man of peculiar habits. The writer said that it was his custom to reach the factory of the Cash Register Company, of which he is the head, at 7 a. m. six days in the week, and that he busied himself at the plant until 12 noon, at which time he invariably left the plant, devoting the balance of the day to rest and recreation. Now, that is perhaps a pretty good scheme for the man at the head of a great institution of that sort, but we brickmakers would bump the bumps if we tried to run our business on any such plan. Mr. Patterson is said to have a fad which most of us might adopt with profit. He believes in travel as an educator. The story I read stated that in talking to one of his faithful employes he found that he had never been to New York City, so he promptly gave him two weeks' vacation on pay, told him to visit Washington, New York and Boston and render a bill for the expense of the trip to the company. The young man, of course, was greatly surprised and asked what he was to do on the trip to justify the expense, and Mr. Patterson said: "Look, listen and think, and you will gather enough information to make the trip worth while to the company."

There is a good suggestion in this for the managers of plants. I believe it pays well to make trips of inspection. Last spring I visited nearly all the paving brick plants in the country east of the Ohio line and some in Ohio, and I got suggestions and pointers from nearly every one of them that more than paid me for the time and expense of the trip. Clay plants cannot be equipped and run by any set plan or formula, as is the case in many other lines of manufacture, for the reason that our material differs. There are no two clays alike, and consequently no two plants can be just alike, but we can all of us profit by comparing notes and adapting improved methods and labor-saving devices to our own conditions.

A. S. Reid, Newark, N. J.

ATTENDANCE AT CONVENTIONS A GOOD INVESTMENT.

I am confident that these annual conventions are a source of actual profit to all of us who come with an open mind and with the purpose of adding to our store of knowledge on the various details of our business. I believe it would pay owners of plants to send their superintendents to these conventions. Indeed, I know some of the older members have made it a practice of doing so, and they have always claimed that it was money well spent.

Just at this time, when our boasted civilization seems to have run amuck, and the great nations of the old world are striving to exterminate one another, it seems to me that there is one word we might all of us emphasize and cherish as the most important by-word of the times, and that is loyalty. Loyalty to our nation, loyalty to our industries, loyalty to this organization and loyalty as citizens in our respective localities, insures better conditions for ourselves and for those who come after us.

The spirit of loyalty was well exemplified in the selection of this city as our place of meeting this year. The majority of the executive committee—I know I speak at least for the secretary, Professor Orton and myself, for we talked the matter over together carefully—had we followed our personal bent and pleasure, would have urged the selection of Atlantic City, for that famous resort appealed strongly to us from the pleasure side of the proposition, but when the Complete Building Show project was launched, and we were urged in the interest of better building methods and materials to lend the influence of this association to that undertaking, we laid aside our personal preferences and gave up the anticipated delights of a week at the seashore to accept the call from Cleveland. The splendid assembly here is proof of the wisdom of our choice, but, just the same, the majority of our executive committee who made the sacrifice, are entitled to the credit of loyalty to the association and the interests of the industry. If an era of better building follows in the wake of the show, we may feel that our judgment was good and our efforts not in vain.

Loyalty is a crowning virtue. With a true spirit of loyalty, preparedness will take care of itself; individually as clayworkers and collectively as a nation, we will meet the opportunities and emergencies as they arise and acquit ourselves in a creditable manner and the things we stand for.

Certainly no industry is more deserving than that of brickmaking. It is no mean industry, as is indicated by the government statistics. It ranks third in the value of annual production, and in so far as the permanent wealth of the nation is concerned, it really stands first, for structural materials of burned clay become a permanent addition to the nation's wealth. It is the only manufactured material of which this can be said. The value of the coal mined exceeds the value of clay products, but the coal is consumed, it goes up in smoke, and that ends the existence of the coal, except paying the bill. The same is true in a measure of all other manufactured products, for their use means their consumption, while brick, tile and terra cotta are indestructible and the products of today will be in evidence for generations to come. The work of other industries are temporary in character. Lumber decays and must be renewed. Steel rusts and must be replaced with burned clay. We build for all time to come. The brick in this beautiful hotel, for an illustration, may be taken down and used again a hundred years from now, if it so suits the fancy and desire of the generation of that day. There is every reason why we should be proud of our industry and loyal to its every interest.

As I have previously stated, the work of this association has been educational, with a view of producing better products in larger quantities and at lower cost, and this, I think, is as it should be. It has of late years been suggested that the time has come when more attention should be given to the market side of the brick business. I have no objection to that idea, but I am firmly convinced that that phase of the business should be considered and managed as a local proposition. The manufacturers in the various States or principal commercial centers may operate with advantage to themselves and the consumers of clay products, but it is hardly the province of a national organization like this to do more than advise and encourage effective co-operation among manufacturers in their own respective localities.

The movement inaugurated at our last convention for the establishment of a publicity bureau certainly deserves the most liberal support of every manufacturer of building brick. While I myself do not manufacture building brick, I was so much interested in this movement, which was inaugurated while I was president, that I went to Indianapolis at my own expense and attended the meeting of the committee which I appointed for that purpose. Most of the delegates appointed were present, and evinced much enthusiasm, pledging themselves and their associates to the active support of the bureau. I made it my business to bring the matter to the attention of the Pittsburgh Clay Club before and after the Indianapolis meeting, and on my invitation Secretary Randall came to Pittsburgh for the same purpose and presented the proposition to the members of the club. They, one and all, agreed that the work contemplated was very important, but when it came to pledging financial support they quibbled. I paid my portion as a member of the club, and have repeatedly urged the officers and members of the club to do likewise, but up to the last report I received only twelve of the thirty members of the club had done so. One thousand dollars was pledged, but only $225 of same was actually paid. If the same conditions prevail in other brickmaking centers, our efforts to boost the industry cannot be as effective as it should.

If we compare this feeble effort—feeble because brickmakers are so slow to respond to what they admit is an important movement in their own interest—to the liberal support accorded by the lumber and the cement interests to their organizations, it is not hard to understand why those interests grow and prosper, while ours seem to lag and languish. I wish I had the power to awaken the building brick men of the nation to the importance of concerted effort. As your chief executive, I have done all I could do to that end. I hope my successor may be able to do more than I have in this direction. However, I have my consciousness of having done my best.

I have taken both pleasure and pride in my official connection with this organization. It has been a great help to me, and I propose to prove my appreciation for the honor and consideration shown me, by doing everything I can to promote the interests of this association and extend its field of usefulness. While I have other irons in the fire, I expect to continue a brickmaker as long as I live, and I expect my sons, who are now with me in the business, and their sons, to follow in my footsteps. I think that they will in their turn contribute their mite of loyalty to this organization, just as I have tried to do.

I am yet a young man in feeling and ambition, and though after this session I will be a "has been" officially, I hope to continue to do my full part in maintaining this organization as an active influence for the betterment of the entire clay craft, just as some of my very worthy predecessors have done and are doing.

I feel that as an ex-president I am in very good company when I come to these annual meetings and stand shoulder to shoulder in solid phalanx with Ittner, Richardson, Gates, Eisenhart, Blair, Conway, Gregory, Parker, Rogers and Rodgers, and others who are always found present and attentive at our sessions. It is to these faithful leaders and the untiring efforts of our faithful secretary that this organization owes its long life of usefulness.

This is our thirtieth anniversary, and thirty years is a long, long time in the life of men and an industrial organization. It is said there is only one way to judge of the future and that is by the past. The association has been a power for good in the past, and I am optimistic enough to believe that it will be just as successful in the future. I will soon take off my black cloth and hand this gavel to my successor, don the red and again take my place among the rank and file of the membership, but before doing so, I want to again thank you, one and all, for the kindly consideration shown me and the cordial support and assistance you have given me in the performance of my official duties. I hope to prove my gratitude by serving this association loyally in the years to come as I have in those gone by. (Applause.)

President Mayer: The next in order is the report of our treasurer. (Applause.)

REPORT OF TREASURER SIBLEY.

To the Officers and Members of the National Brick Manufacturers' Association:

Gentlemen—It affords me peculiar pleasure to present you in person my report of receipts and disbursements for the year just ended.

First. Because I have the pleasantest recollections of the two former conventions I was privileged to attend in this delightful city, and I am glad to be a guest of these royal hosts in Cleveland.

Second. Having been prevented from meeting with you in Detroit, it makes me happy to greet the old friends once more and share in welcoming the new.

Third. It is gratifying to me, as I know it must be to you, to report an increase of $115.03 to our surplus, making the total balance now in the treasury $564.49.

But I was considerably perturbed over the requirement to have some fun in the report or lose my job, as it has not been a joking season since this cruel war began. But I have a warm sympathizer in our beloved friend, Mrs. Anthony Ittner, who, knowing that her good husband's resolution was as unchangeable as the laws of the Medes and Persians, and that she could not attend the convention and plead for mercy for me, he kindly sent me the following anecdote, which is so apropos I rely confidently upon your taking the hint:

HE WAS UNANIMOUSLY ELECTED.

When the term of the old negro preacher had expired, the New York American reports that he arose and said:

"Breddren, de time am heah fo' de relection ob yo' pastoh for anudder year. All dose faboring me fo' yo' pastoh will please say 'Aye'."

The old preacher had made himself rather unpopular and there was no response.

"Ha," he said, "silence gibs consent allus. Ise yo' pastoh fo' anudder yeah." (Laughter.)

Thanking you in anticipation for your kind consideration.

Respectfully submitted,
JOHN W. SIBLEY, Treasurer.

Receipts and Disbursements Account of the Twenty-ninth Annual Convention National Brick Manufacturers' Association February 15-20, 1915.

RECEIPTS

Balance in treasury, account 1914		$ 449.46
New members, 56@$5, account 1915	$ 280.00	
Old members, 477@$3, account 1915	1,431.00	
Reports, pamphlets, etc.	195.00	
Total receipts		1,906.00
		$2,355.46

DISBURSEMENTS

Paid for Convention program, mailing, etc.	$ 108.00	
Paid for Convention report, mailing, etc.	283.25	
Paid for Harrop pamphlet, Kiln Expansion	18.00	
Paid for Blackburn pamphlet	26.75	
Paid for 1,000 pocket list members, mailing	39.00	
Paid for membership American Soc. Test. Mat.	10.00	
Paid for miscellaneous printing	179.06	
Paid for engrossing membership certificates	5.70	
Paid for numerical roster	55.00	
Paid for extra badges	35.08	
Paid for postage, telegrams, expressage, etc.	141.13	
Paid for lantern	30.00	
Paid for membership Natl. Cham. of Com.	10.00	
Paid for clerk hire	300.00	
Paid for assistant secretary	200.00	
Paid for secretary's traveling expenses	350.00	
Total expenses		$1,790.97
Balance in treasury		564.49
		$2,355.46

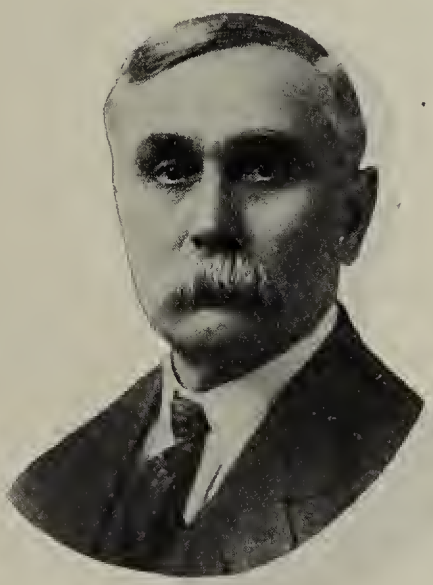
RECAPITULATION

Balance account 1914		$ 449.46
Total receipts 1915	$1,906.00	
Total expenses 1915	1,790.97	
		115.03
Balance in treasury 1915		$ 564.49

(Applause.)

President Mayer: You have heard the treasurer's report, what will you do with it?

J. Fred Smith, Omaha: I move the adoption of the report.



J. Fred Smith, Omaha, Neb.

H. C. Kleymeyer: I second the motion.

Motion carried.

President Mayer: The next in order is the election of officers. The chair is now ready to receive nominations for president.

Election of Officers.

M. E. Gregory, Corning, N. Y.: I think we have just one candidate for the office of president of this association. We have one man who is eminently qualified to fill this office and it gives me great pleasure to nominate Charles J. Deckman, of Cleveland, for president of this association. (Applause.)

R. G. Eisenhart, Horseheads, N. Y.: I second the nomination and move the nominations be closed and the election made unanimous.

Seconded by several and carried.

President Mayer: Nominations for first vice president are now in order.

Secretary Randall: Our second vice president, Mr. Fritz Salmen, who in the natural order of events would be promoted this year to first vice president, is confined to his home with pneumonia. I have a letter from his son Fred, saying his father is improving. I nominate Mr. Salmen for first vice president and think it would be well to send a message to Mr. Salmen conveying to him our sympathy and the hope that he will soon recover and include in that message the advice that he has been elected first vice president.

Levi Marshall, Horseheads, N. Y.: I second Mr. Salmen's nomination for first vice president and also Mr. Randall's motion that we send Mr. Salmen a message.

President Mayer: If there are no other nominations I declare Mr. Salmen duly elected. You have heard the motion that we send him a message of sympathy. I think we can take that by consent. Nominations are now in order for second vice president.

Charles H. Bryan, Detroit, Mich.: Mr. President and Gentlemen of the National Brick Manufacturers' Association—Detroit has as you know a candidate for second vice president. When Mr. Randall was in our city some time ago he asked Mr. Wreford to write a paper on "What's the Matter with the Brick Business," and he said he thought Charlie Bryan would read it and then he thought maybe I would rather write it and let Will Wreford read it. But Wreford has confidence in himself and he has written the paper and he is going to read it, too. Since Mr. Randall was in Detroit I have been doing some thinking on this business and I have come to the conclusion that there is nothing the matter with the brick business, but there is something the matter with the fellows in the brick business. We, in Detroit, are well satisfied with our little effort in promoting the brick industry and Detroit's candidate, we thought we were going to lose him when we gave him to you for the position that is leading up to fame in this organization. He is worthy of the honor you have given him and if he is able to control such wild fellows in Detroit as me, I am sure he will be able to carry out his part in this association. If we could all only practice that splendid disposition that is displayed by our honorable citizen of Detroit, Mr. George H. Clippert, if we could all extend such an influence on life to those not as fortunate as we, if we could all extend a helping hand such as Mr. Clippert always does, then the president of this organization would not have to cry out as did the Christ of old, "Jerusalem, Oh Jerusalem, I would have gathered you under My wing as a hen gathers her brood." And as the president and officers of this association have to go out and get together all the brickmakers of this country even as a hen gathers her chickens under her wing and so as we come to the end of life and recall those beautiful words "when we find at the end of a perfect day the soul of a friend we've made." In George Clippert we have a type of a perfect man and I am very proud to nominate him for second vice president.

Charles H. Bryan, Detroit, Mich.

J. Fred Smith: I second Mr. Clippert's nomination and move that the regular order be followed out where we have but one candidate.

Seconded by several. Carried.

President Mayer: You have elected Mr. George H. Clippert for second vice president and we are now ready for nominations for third vice president.

John H. Andres, Evansville, Ind.: Mr. President we all take our hats off to Detroit, but it has been a long time since Indiana has been represented among the vice presidents and as Indiana is one of the leading clay states in the Union and in it are located so many splendid brick plants, we would like to ask your kind consideration. Among the many up-to-date progressive, wide-awake brick manufacturers of Indiana is Mr. J. W. Robb, of Clinton, and I desire to nominate him for third vice president. (Applause.)

Jotham Past, East Williston, N. Y.: I second Mr. Robb's nomination and move that if there are no other nominations that the secretary cast the unanimous ballot of this convention for Mr. Robb.

Marion Blair, Thorntown, W. Va.: I second the motion.

Carried.

President Mayer: Mr. Robb has been elected third vice president and we will now hear nominations for treasurer.

W. D. Gates: While it does not seem necessary, inasmuch as in the absence of our old friend Anthony Ittner, Mrs. Ittner has practically made a motion which you all heard nominating the treasurer, still in Mr. Ittner's absence and thinking of the many times he has placed Mr. Sibley in nomination and the many times he has urged the fact that that candidate should introduce humor into finance, and thinking particularly how that man has never failed to do so even under these strenuous financial conditions of the past few years, it seems to me that a man who can continue to get any fun out of financial reports under the circumstances is eminently fitted for the position. And so ratifying Mrs. Ittner's nomination, I nominate Mr. John W. Sibley and move that the secretary be instructed to cast a unanimous ballot for Mr. John W. Sibley. of Birmingham, Ala., for treasurer. (Applause.)

Warren Griffiss, Baltimore, Md.: I second the motion.

Carried.

President Mayer: Well we have elected a treasurer and what are you going to do about the secretary?

William A. Bailey, North Hampton, Mass.: Mr. President, I move that the president of this association cast a unanimous ballot for our faithful secretary, Mr. Theodore A. Randall, of Indianapolis, Ind., to succeed himself.

Eben Rodgers, Alton, Ill.: I second the motion, Mr. President.

Motion carried.

President Mayer: I cast it and I cast it as hard as I can. (Laughter.) Old top, you are elected. (Laughter.) Please announce the next order of business, Mr. Secretary.

Secretary Randall: This is so sudden. (Laughter.) We have a committee on technical investigation, a member of which is elected each year, and now is the time to take that up, as all of the officers have been elected. The assistant secretary, as you know, is an appointive office. The committee on technical investigation was changed some last year owing to the death of one member and the withdrawal of another. As it stands today, the committee consists of:

Marion W. Blair, Thornton, W. Va., whose term expires 1920; R. Kanangeiser, Bessemer, Pa., whose term expires 1919; Prof. Edward Orton, Columbus, Ohio, whose term expires in 1918; W. D. Richardson, Columbus, Ohio, term expiring 1917, and Prof. A. V. Bleininger, Pittsburg, Pa., whose term expires this present year. I think there is no question as to what our course will be in this matter.

M. E. Gregory: I move that Professor A. V. Bleininger be re-elected to succeed himself.

C. C. Barr, Streator, Ill.: I second the motion.

Motion carried.

Installation of Officers.

President Mayer: This brings us to the installation of officers, and I appoint Mr. Gregory and Mr. Andres to escort the newly-elected officers to the platform.

(The gentlemen named escorted President Deckman to the platform amidst applause.)

President Mayer: It gives me much pleasure in completing my duties as president of this association to install Charles J. Deckman, of Cleveland, as my successor. Mr. Deckman, you have been honored by the greatest clay-workers association in the world by this action conferring on you the highest honor in their power. Evidently they have in the last three years of your official career made up their minds you would be a fit and proper person to elect as president of this association and I want to assure you, Mr. Deckman, in handing you this gavel, the emblem of authority, that with it goes my best good will for the National Brick Manufacturers' Association and for your personally. It gives me pleasure immeasurable to introduce you to this convention as my successor. I have the pleasure to introduce to you, ladies and gentlemen, Charles J. Deckman, of Cleveland, as your president. (Applause.)

President Deckman: Ex-President Mayer, Ladies and Gentlemen—Not desiring to reflect at all upon the policy of the retiring president, but I want to impress upon you that one of the policies of the acting president will be brevity and punctuality. As an officer, it has always been my pleasure and, as I have seen it, my duty to be very faithful in attendance at the sessions of the convention on time, and I believe that the best interests of this organization, as in that of other organizations and individuals will be conserved by promptness and punctuality. The rules of this organization seem to be largely local, but little more than our social affiliations. We do not seem to extend our relations aside from the papers that are presented and discussed in the various sessions. It has occurred to me that this organization might be of greater benefit to its membership if we were to give some consideration to the commercial and industrial questions, as they fit each of our individual members and while I am not going to advocate a policy along that line it would seem to me that during the coming year if the officers of our association could, say collect data for the promotion, for the welfare of the individual interests, that the association itself would benefit thereby. And now as I pledged you in the beginning I expected to adhere to the rule of brevity, I thank you sincerely for the honor conferred upon me. (Applause.)

Presentation of Gift to Mr. Randall.

Thirty years ago you elected for the first time Theodore A. Randall as your secretary. You have elected him again for the same position, and during this time, as has been said by your retiring president, he has served you faithfully and well. There have been those in this association who have found fault with some of his administrative methods, but there have been many, many more loyal friends of his in this association who honor and love him. A great number of his friends throughout the width and breadth of the territory embracing the membership of this organization, have seen fit to delegate me on this occasion to remind Brother Randall of the faithful duty he has performed for this association. At this time, Mr. Randall, they want to express to you their appreciation of your services and as a slight token of remembrance we present to you this beautiful mahogany graphonola, which we trust you will take with you to your home that your family may enjoy it; that Mrs. Randall, who had to remain at home many nights while you have been elsewhere, shall enjoy the pleasure of this beautiful piece of furniture, and I assure you the strains you will now have the pleasure of listening to will be in full accord with the best wishes of its donors. (Applause.)

(During Mr. Deckman's remarks, Mr. Lawrence Koblitz had brought forth a beautiful mahogany table. At the conclusion he touched a spring which opened a drawer disclosing a Columbia phonograph, and the convention listened to a piece of rag-time music.)

Secretary Randall's Response.

Secretary Randall: I suppose there must be a first time for everything. Today was the first time I was ever asked to go out of the convention and I obeyed. (Laughter.) As the president said, thirty years is a long time in the life of an industry, or in the life of an individual, it is nearly an average lifetime. This is not the first time in thirty years that I have had to acknowledge the goodness and kindness and affection of the members of this association—I seem to be troubled with a little affection of the throat that affects my speech. I have a lot of things I would like to say. I think you would do better if you would get Mrs. Randall to come and make a speech just now (laughter). I have carried on my person for twenty odd years a beautiful timepiece which was given me by the members of this association at Memphis and it has been a constant reminder of the kindness and good wishes of the members. Those whose friendships have been the brightest things in my life. We have at home a beautiful silver service given us at St. Louis, it is indeed a beautiful gift. We have prized it and it has been a joy to the whole Randall tribe. We do not hide it away and those of you who come to our home see it in constant daily use. At first Mrs. Randall prized it so highly she almost slept with it at night for fear some one would come in and steal it and when she went away from home she would put each piece in the little flannel bags furnished with it, and hide it away in a secret closet. But now we have it on our sideboard at home, as I have said, in constant daily use. I realize I am talking to friends and if it were not for this nervous affliction in my throat I would like to say something of the fellows who are not here. I was thinking as I sat there and looked into the kindly face of the divine who prayed for us of a little anecdote which if I can tell it will express my feelings. This divine had lost one eye, he was going along the street one day and he saw a little urchin sitting on the curbstone holding onto a string, he said: "My boy, what are you doing?" The little boy said, "I am flying

Hundreds of the Friends of
THEODORE A. RANDALL
Offer This Token of Their
CONGRATULATIONS
on
Thirty Years of Faithful and Distinguished
SERVICE
Speaking for Them It Will Speak Well
Singing It Will Sing Praises
Cleveland, Ohio
Charles J. Deckman, Executive Chairman
W. H. Gifford H. H. McDonald
John F. Leonard
Lawrence Koblitz, Secretary

Inscription on Secretary Randall's Graphonola.

my kite." The divine said: "I don't see any kite." "Well," he said: "It is out of sight." The minister said: "How do you know it is there if you can not see it?" "Oh," said the youngster, "I can feel the pull on the string." So I will feel your love and affection and that of the friends who are not here, pulling on the string of memory as I hear the music from this beautiful gift. (Applause.) My throat is getting worse and if you really want a speech, you will have to send for Mrs. Randall. (Applause.)

Presentation of Loving Cup to President Deckman.

Floyd E. Waite: This seems to be the afternoon for good fellowship. As I sat here listening to these beautiful words of presentation and the heartfelt words of thanks I am reminded of the little boy who went to church. He was a ragged little urchin some of the good ladies had picked up and they thought they would make a christian out of him. They took him to a Sunday school picnic and they started in to feed him as good as they could. After they had given that little boy some of the best of everything they had at the picnic somebody offered him something else and he said: "I can still chew, but I can't swaller." (Laughter.) I come before you now, not representing the city, but representing the friends of the man whom you have elected to be your presiding officer for the coming year. I come before you representing the members of your organization in the city of Cleveland, among whom your chairman has lived and worked and spent his life. You know a man is respected and admired by his neighbors, the ones he lives next to, the one who has trouble with his dogs and chickens and children—if they can love him and appreciate him then surely all the world can look to him as a man. We who have worked and labored and lived alongside this man Deckman have learned to love, honor and appreciate him. And it is for this purpose we bring him this gift. This gift of the heart and affection of the men who know him in Cleveland. We know you like him and respect and honor him or you would not have elected him to this high office, but we want you to know how much we not only honor and respect him, but love him and so we present to him this silver loving cup as a token of our kindest appreciation, of our highest esteem and our warmest affection. (Applause.)

John Andres, Evansville, Ind.

Mr. Deckman's Response.

Mr. Deckman: Mr. Waite and Ladies and Gentlemen of the Convention—This token of esteem and affection from my Cleveland friends certainly is beyond my reasonable expectations or reason to believe that I am worthy of its receipt. I assure you, however, that I appreciate the splendid message and the words which Mr. Waite presented this to me. I shall ever cherish it with fond remembrance of the good wishes expressed. I shall ever remember the words Mr. Waite used in his presentation. I thank you most heartily. (Applause.)

Secretary Randall: There is a first time for everything as I said, and we will have something here that is a little bit unusual for our first afternoon's program, but we have with us the young lady who sang for us last night in the paving brick meeting and I will ask her to sing for us a little song she has paraphrased—a song of welcome to the brick manufacturers. (Applause.) The lady is Miss Elsie Hamilton Norton, of Cleveland.

Miss Norton sang an original song welcoming the brick manufacturers to Cleveland, which was greeted with much applause.

President Deckman: Our first vice president, Mr. Fritz Salmen, being absent on account of illness, the same committee who escorted me to the platform will kindly present our second vice president.

Mr. Gregory and Mr. Andres escorted Mr. Clippert to the platform.

President Deckman: Ladies and Gentlemen—I am pleased to introduce to you your second vice president, Mr. George H. Clippert, of Detroit, Mich. (Applause.)

Vice President Clippert: I was in hopes the president would forget all about me. I had been sitting quiet and looking around to see if there were any more tables, or cups, or anything like that. (Laughter.) Mr. President, I congratulate you on being so fortunate as to be elected president in your home city. The city which can produce such an elaborate building show as this city has, certainly must feel proud in having you as the president of the National Brick Manufacturers' Association. I am very sorry indeed my good friend and your good friend, Fritz Salmen is not present, because I feel somewhat safer when I am following in his footsteps. I hope we will have him with us next year well and strong again, ready to step into your seat, Mr. President. If my friends from Detroit are going to keep on saying such nice things about me, I am afraid I am going to have my head swelled before I get where you are, Mr. Deckman. And I do hope the next time the first session will be a dry one. (Laughter.) I want to thank you, of course, ladies and gentlemen, for this high honor. I am going to try to deserve it another year. I do not know what else I can say at this time, but I thank you all very much. (Applause.)

President Deckman: Will the committee now kindly present Mr. Robb, our third vice president.

Mr. Robb was escorted to the platform by the committee.

President Deckman: Brother Robb, with a paving brick manufacturer on both ends and the building brick manufacturers in the middle, we will surely make a success of this administration. Ladies and Gentlemen, your third vice president, Mr. J. W. Robb, of Clinton, Ind.

Vice-President Robb: Mr. President, Ladies and Gentlemen of the Convention—I deem this the greatest honor that has ever been conferred on me; to be elected third vice-president of this grand organization whose friends I count from the Atlantic to the Pacific, from the Lakes to the Gulf, whom I am always glad to meet and who have given me such words of welcome from time to time and who have now conferred upon me an honor I little deserve. I am reminded of a little story I want to tell you. A few years ago a new railroad was projected into the country. Some of the country boys who had never seen a railroad wanted to see the engine and the train so a couple of them went down to the railroad station and looked the train over. The engineer had got down from his engine and begun to oil the engine, one of the boys said, "Be you the engineer?" "Yes," replied the engineer. The boy turned to his companion and said. "Say, Bill, it don't take much of a man to be engineer, does it?" (Laughter.) That is the way I feel about the third vice-president, when you elect me to this office. I thank you for this honor and after paying my respects to Old Glory, which hangs over our heads, I pledge to you my best efforts for this convention and for the organization. I thank you. (Applause.)

President Deckman: Ladies and Gentlemen, the chair now has the distinguished pleasure of introducing to you John W. Sibley, your treasurer. (Applause.)

Treasurer Sibley: Mr. President, Ladies and Gentlemen, I thought we had agreed that silence was golden and I was not going to have anything further to say. You all remember that a great many years ago—I am not going to say how many, because that would make me too ancient, even if I am bald and turning gray—P. T. Barnum was exhibiting the Siamese twins; they created quite a sensation. A certain minister and his daughter went to see them and they were much interested and asked many questions, and finally the reverend gentleman asked if the twins were brothers. Oh yes, he was told, they were brothers. Turning to his daughter he said, "Well, well, Mary, think of the gracious and Divine Providence to permit them to be brothers instead of strangers." (Laughter and applause.) Well, friend Randall and I are not brothers in flesh, but you have linked us together for so many years that I guess we are the Siamese twins. (Laughter and applause.)

President Deckman: Secretary Randall needs no introduction and we have already heard from him. However, I believe he wants to announce a change in the program.

Secretary Randall: We have on our program for the first paper an address, "As Others See Us," by one of Cleveland's most able speakers. He went South for his health some time ago. He is home now, but is unable to be here this afternoon, so we will have to pass that number. Some one suggested that Mr. Will P. Blair would lead the discussion of this paper but I doubt if Mr. Blair would care to speak in place of the paper itself, so I suggest we pass on to number two, a paper entitled "Progress and Prosperity," by F. W. Fitzpatrick, Washington, D. C. However, before we go into the program, perhaps it would be well to announce the program of entertainment. We announced in our printed program what we thought was the program of entertainment for the week, but you know the old saw of "man proposes," etc. The local committee being a law unto itself has planned something which they think will be more pleasing to those in attendance. So, instead of a smokerette this evening, with the ladies and gentlemen both present, they are going to give a stag smoker and take the ladies to the theater. That is their program, and, of course, as we are their guests we must submit humbly to their will. I think this is the only announcement we care to make now this evening, the local committee will make further announcement as they see fit. Of course, we will have our banquet tomorrow night as usual. We are going to have some eloquent speakers and splendid music, in fact, it will be the equal of any banquet we have ever had. Incidentally I would say, if you have not got your banquet tickets you had better get them now. (Laughter.)

Returning to our regular program, the subject which was to have been discussed this afternoon, and it would have been discussed very ably too, if Mr. Rose had been able to be present, dealt largely with publicity and the need of getting to the front the needs of the industry which we represent. The president touched on it in his address slightly. The paper to be read on Progress and Prosperity by Mr. Fitzpatrick, Washington, D. C., deals with this subject. Mr. Fitzpatrick was one of the first to suggest a publicity move for brick manufacturers. I have not read his paper as yet, but I know it is very good, for anything that Mr. Fitzpatrick would write would be good, of course.

PROGRESS AND PROSPERITY.

BY F. W. FITZPATRICK.

Mr. President and Gentlemen of the Convention:

It is the fashion at all college commencements to have a class poet, a valedictorian and other specialists performing upon wind instruments. In looking back at my slight vocal and instrumental efforts at former conventions of this august body, it seems to me I might well be called not your valedictorian nor your poet, but just your perennial kicker, your annual scold, your regular exhorter and general disturber of the calm and peace that habitually reign in the seried ranks of the brickmakers of America.

Well, to keep up to my reputation, here goes for 1916. First and foremost, let me wish you all health and happiness and prosperity—which means, of course, heaps, loads, just slathers of brick, and all sold at war prices. Then, let us, hand in hand, saunter around a bit and look at a few interesting things, events, conditions and what not that will help us in the introspect I'm going to suggest, following this inspection of externals, so to speak.

The great war is, of course, the all-absorbing topic; it, by all rights, has the center of the stage and it can well serve as a text for our sermonette and be the first great condition or event at which we will glance.

Note that for over a year the allies have been preparing, preparing in haste, under terrible pressure and appalling disadvantages and are still unready for the crushing blow they were so confident they could administer. Note the recriminations, the self-accusations, the excuses that are being made for their foolsih unpreparedness when the war began. Glance at the Teutonic side of the picture, whatever may be the outcome of the awful mixup, we have to take our hats off to our German friends for the thoroughness of their preparation, for their clock-like precision and wonderful efficiency. There is no splitting of cabinets there, no dissensions among the leaders, no question of authority among the generals, everything goes along just so, if a man doesn't fit, out he goes and a better man takes his place, troops come up at the right time, their equipment is complete, their food is there with them, everything is foreseen, prearranged, timed and you find everywhere efficiency itself with a big, big E.

F. W. Fitzpatrick, Washington, D. C.

Now let us retrace our steps, still hand in hand, back to our own country. What is uppermost in discussion, in the air, all about us? A feverish anxiety to correct a mistake we've been making for years. True, there are about four million fewer Europeans to attack us than there were last year and as the Europeans have been exhausting their substance we've been increasing, adding to ours. But we suddenly realized that in the face of a possible clash anent our interests, or our people traveling upon the seas, we are not in any position adequately to enforce our demands, to put across and back up any bluff we may feel should be made. We've spent vast sums upon navy and army, but that money has been ill-handled, at least we're getting blamed little for it as compared with what other nations have done with like sums. We always were an extravagant people, reckless with our public money, and our contributions to pork-barrels and such are really indecent. Well, someone or something has thrown a scare into us and we suddenly realize we've gone along blindly and are terribly ill-prepared for most anything that may happen and that it's up to us to make some preparation. Having to do it in a great rush and excitement means, of course, that it's not going to be very efficiently done. That's inevitable.

Some of us cranks have expected some such condition to arise and have preached and begged and fussed for years for some encouragement to American shipping. We need ships, commercial ships, for our trade, to carry our goods to Europe, to South America, to the Orient. We need those great freight ships for transports, auxiliaries to our navy if there should ever be a scrap in which, unfortunately, we might be mixed. And just now the country has wakened to the fact that there are wonderful opportunities all about us, but that we have no ships, no means of taking advantage of those markets, we are utterly at the mercy of the nations that do have ships. For years everything possible has been done to discourage ship-building and ship owning here. Our flag has been driven off the ocean not by our enemies, not by competition, but by our own will, our own stupidity, our own lack of foresight and efficiency.

If you want a sickening but graphic illustration of our lack of forethought, come with me to New York and see the miles and miles of cars of blocked-up freight that have been waiting for weeks for shipment abroad in foreign boats. A condition that is as severe an indictment of our ways of doing things as there could be made. There really is an embargo on freight to our seaports, and that at a time when everything we have to sell is needed abroad and when we could so well be making much hay while the sun of opportunity shines—albeit that is rather an ill-chosen simile or proverb to apply to any phase of a world's war.

Some of our alleged statesmen are also just waking up to the fact that with our laws and ways as they are, soon as the war is over we will either be overrun with immigrants from the bankrupt nations, men glad to get away from their native heaths at any price, an influx that is bound to disorganize our labor and raise Cain generally. Or they'll stay home and proceed to load us up with imports of cheaply-made goods, famine-priced manufactures that will just as surely disorganize labor and bring about a condition that will make us sorely regret our unpreparedness in matters commercial as well as martial. The country should have been safeguarded against those contingencies. Anything we can do now, in haste, will be haphazard and purely a political, a party makeshift. Greater efficiency would have kept us ready for all that sort of thing, it would have made it so, for instance, that we could make our own dyes (for which the country is literally famished today) it would have protected such industries as that, the ones we absolutely need and have not, and it would have properly bridled those of our big industries that no longer needed protection and showed indications of wanting to ride us. Forethought, efficiency, preparedness, are big words. Keep them well in mind.

Now then, having gotten through with that preamble, let us, still hand in hand, get back to the brick industry, from which we have made this little excursion. What do we find of forethought, efficiency, preparedness, there? Truth compels me to answer, "Blamed little!"

You see all sorts of preparation being made about you, the cement people are solidly organized and doing fine teamwork; the lumbermen ditto, so are the stone interests and even the flesh of your flesh, the hollow-tile folk, are spending money, planning campaigns and hustling generally. And what, in the main, are they afraid of and fighting covertly if not in the open; what or who is supposed to be the common enemy?

If I were a politician of oratorical inclination, I'd frantically wave my arms, shake my cuffs down over my finger tips and with great beads of perspiration upon my massive brow and with eyes glaring wildly, I'd thunder out in answer bold the one word BRICK!

Those interests are not to be ignored, either. You may say that every building material has its proper place in the upbuilding of the country and that its own worth, its splendid achievements in the past, its historical fame will maintain BRICK in its place as the greatest of all materials. But, beloved brethren, experience teaches us that persistent and insistent knocking will wear out anything, even a brick. To sit down in smug complacency and let your opponents hustle, means just one thing eventually. Think over what we have seen in our little saunter hand in hand and then look about you in brick and again note in how much of a figure forethought, efficiency and preparedness cut in the industry as a whole.

Twice or thrice before I've raised up my feeble voice in prayer that you get busy, and you've done me the honor of appointing committees and this, that and the other thing to help boost brick along as it should be boosted, but, by heck, though good work has been *started*, you've not stuck to it; you've let your enthusiasm peter out; you've not supported your own creations; you have let things drift.

Some of you will tell me that local effort is the proper caper. I believe in local effort, and Detroit, for instance, has shown what some slight co-operation will do. I also believe in co-operation, but I want wider co-operation. I can't for the life of me get it into my noodle that the brick industry is, as so many of you claim, purely a local proposition. It is, as far as *results* are concerned, granted, but when it comes to a campaign of education, to devising means to create the causes that will produce those local results, your local efforts are bound to overlap, to clash, to be excessively costly, and not nearly as effective, as far-reaching, as a well-supported, co-operative national effort.

You seemed to see that last year. You organized a National Bureau, you promised it much help, it was expected that you would give it enthusiastic and skilled assistance, moral, physical and financial. Did you do it?

If you didn't why, just think over what we have seen of unpreparedness and other national follies and then proceed with alacrity and with chastened spirit to purge yourselves of your carelessness and simply overwhelm Brother Randall with your belated subscriptions, not in words, vague promises, but in good hard coin of the realm. Your committee in charge of that bureau will know what to do with the two or three hundred thousand dollars you will put into its hands, just like that.

Forethought, efficiency, preparedness! Inscribe those words upon your banners and then don't content yourself with just inscribing them, but get busy and *act* them. Amen. (Applause.)

President Deckman: The discussion of this paper will be lead by Mr. B. W. Ballou, of Buffville, Kans.

General Discussion.

B. W. Ballou, Buffville, Kans.: Mr. President and Gentlemen of the Convention—I do not know that I can add anything to what Mr. Fitzpatrick has said in regard to this very important subject of Progress and Prosperity, but if I can say a few words that will emphasize some of these thoughts I will be justified at least in the attempt. Some months ago we received a letter bearing the name of a well known contractor to whom we were selling at that time. We had been selling him a lot of material and his account was a couple of months past due. We opened the letter and found that it read as follows:

B. W. Ballou, Buffville, Kansas.

"Dear Sir—We enclose herewith our check for one thousand dollars. The material has not been received as yet, but we are thinking you can probably use the money anyway. The job has been held up now about two months on account of the delay in this material and we will appreciate it if you will get after the car with a tracer. We hope for the delivery now at an early date."

On investigation I found the letter was not intended for us at all, but for a steel manufacturer, and the next day the steel man sent me the letter intended for me, and it read thus:

"Gentlemen—We have received your several letters in regard to our account. We are thoroughly familiar with the amount of the account, as well as the date of shipment, and it is useless for you to further advise us along this line. The account will be paid as soon as the brick are in the wall and we get our estimate. If this is not satisfactory, let us know and we will make arrangements in the future to buy our brick elsewhere. We have been held up about two months on account of being unable to get the steel and we cannot say when it will reach us, but when it does, and we finish the top story the account will be taken care of in the usual way. Yours truly." Then he said, "P. S.—The representative of the Brown

Brick Co. was here a few days ago, and called attention to the discoloring of your brick, and he further advised us that he could furnish brick that would not discolor at all regardless of the cement used. I have not talked to the owner as yet, but when I do, I will let you know as to what damage you may expect to pay on account of the discoloring of your brick in the wall."

These two letters brought to my mind more than anything else the methods which we have pursued in the business and the difference between it and the method of the other men who are furnishing material of far less importance than brick, and with far less trouble. The steel man was progressive, he had made the contractor pay up all right and the only thing I hated was that Mr. Steel man had seen my letter. There is no question in my mind as to the cause of this trouble, we all know what we need and that is organized co-operation. It takes money to do that and that is what we are needing more than any one thing today.

Our worst trouble is we cannot get the co-operation of the average brickman. You have no idea how many men there are manufacturing brick not represented in this association, who don't take part in any organization, they are absolutely indifferent to outside things. They have been going along in the same old way, taking what little business that comes to them, perfectly satisfied and are willing for you to carry the burden and expense of widening the market.

J. Howard Chambers, Philadelphia, Pa.

In Kansas we are about the geographical center of the United States. When this war came up and you fellows in the East were getting scared, it did not bother us a bit. We thought if the Germans come to New York, they would have a good time getting to us, then there is the same thing on the other side. If the Japs got to the Pacific Coast, it would be a long time before they got to us, and the same thing is true with the Englishmen up in Canada. (Laughter.) Even the governor in our state was making unpreparedness speeches. We were very much like the two Jews going to Europe. There came a big storm and the vessel was sinking, and the one said, "Oh, Iky, Iky, the vessel is sinking," and the other one, who had been in the brick business about ten years, said, "Well, what do we care, we don't own it." (Laughter.)

The condition as I described it in Kansas, is that it is very hard to get the brickmakers to see anything that will awaken them to the opportunities for growth, and those of us who are putting our money and our time in an effort to widen the field must work alone. You can talk to the other fellows and they will tell you they are progressive because they are counting the cost. You know this one word "cost" gives us more trouble than any other word in the English language. These fellows selling appliances come around and say, "we are going to lower your costs," and we fall for it every time. And you talk to these fellows who say they are lowering the costs and the first thing they think of is to lower the price. I think it will pay us to leave the cost where it is and put our money into the market, and widen the market. I heard one brickmaker say, he got that little pamphlet about the cost of brick and read it about half way through and then quit because he was afraid it was true. He did not want to believe it, and yet he called himself progressive.

A lot of these fellows think they are progressive when they buy the Strand and get The Book of Smiles, and borrow the clay journals from their neighbors. They think they are progressive. They can't see anything beyond their own brickyard. I know one fellow who said he had spent five dollars for advertising in three years before and he couldn't see where he had sold any more brick. (Laughter.) I can remember when they had tan yards through the country, the only building they had was a log cabin and the only sign they ever adopted was a hole bored in a board and a cow's tail pulled through it. An old fellow drove by and stopped and looked at that sign. The owner came out and said, "What can I do for you?" and he said, "I was wondering how that cow jumped through that hole and hung by its tail." And so it is with the average brickman, he can't see how he is going to be helped by this great movement. And the question is, how are we going to reach these people? When you get their co-operation you will get the money, and when you get their money, you will get the man's attention. I don't believe a big sum of money is necessary. When you get the co-operation or a man's interest you will get his money, for his interest will follow his pocket book. I believe the time is coming when the brickman has got to do these things. In spite of this prosperity we are having, if we don't do these things to widen out our market, it is going to prove a detriment and a hurt rather than a benefit. (Applause.)

President Deckman: Is there any other member of the convention who desires to further discuss this subject?

Secretary Randall: This finishes the program for the day, and we would like to have a meeting of the directors and members of the National Building Brick Bureau immediately after adjournment, if possible.

J. H. Chambers, Philadelphia: I would suggest that inasmuch as Mr. Randall's voice failed him when he wanted to acknowledge the presentation of this beautiful instrument, that he start up the instrument now and keep step to it. I am sure we will all enjoy it. (Laughter.)

Secretary Randall: I expect to keep step with the music of that instrument for many a day to come.

President Deckman: This convention will now stand adjourned until nine-thirty o'clock tomorrow morning, Cleveland time. We are running here in Cleveland on Standard time, and we will open the convention promptly at 9:30 o'clock.

SECOND SESSION.

Thursday Morning, February 24, 1916, 9:30 A. M.

President Deckman: The convention will come to order. Mr. Secretary, what is the first matter requiring attention this morning?

Secretary Randall: The first number on the morning program is a paper on "Insurance of Brick Plants," by Hubert Somers, Atlantic City, N. J.

INSURANCE FOR BRICK PLANTS.

By Hubert Somers, Atlantic City, N. J.

Mr. President and Gentlemen of the Convention:

When Mr. Randall asked me to prepare a paper for this convention, it occurred to me that our members might be interested in the Anti-Discriminatory Insurance Law passed a few years ago by the Legislature of my native State, New Jersey, for two reasons:

First—Because it provides, I believe, for rates which are fair to both insurer and insured, and I take it that we pay enough fire insurance premiums to be interested in this proposition; and,

Second—Because it encourages in a very definite financial manner the use of fireproof building materials in construction of all classes of buildings, and this is certainly a proposition in which we are all deeply interested.

This subject is, I feel, brought into prominence by the work being done by the Society Advocating Fire Elimination, in which so many of our members are interested.

Prior to the passage of the law referred to the rates in our State, as in most others, were made by a number of separate bodies or individuals, each making the rates in a certain section of the State.

These various bodies had different ideas as to the proper rates for the risks, and all were naturally interested in getting the best possible rates in their particular districts. As individual judgments varied, and as some men are more energetic than others, a great variation in rates in various localities naturally followed.

For instance, take that class, of which there are many thousands—a small stable property—minimum rates in one county varied from minimum rates in another county all the way from 22 cents to 60 cents per annum. The difference in minimum rates between two counties near the middle of the State, adjoining, showed 100 per cent. increase in one county over the rates in the other county—exactly the same class of property, with exactly the same class of protection, and not seashore property; a stable minimum in one large city of 24 cents per annum was commonly used, while in a large city only a few miles away it was the general rule to specifically rate this kind of property at $1.50 per annum, 600 per cent. increase. Dwelling house insurance was also remarkable for the differences in rates and practices. In some sections of the State the charges were more for brick dwelling houses under public protection than charged for frame dwelling buildings outside of protection. Surely discrimination was rampant. A large manufacturing plant, with a co-insurance rate of $2.70, had a rate without co-insurance of $5, the argument of the insurance authorities in charge evidently being that they did not want this risk without co-insurance clause, so the rate, without co-insurance, was made very high. On another large risk of the same occupancy, practically the same location, the co-insurance rate was $3.40; the rate, without co-insurance, only 20 cents higher—$3.60; the argument in this case of those in charge evidently being that it did not make much difference whether the assured used the co-insurance clause or not. They were practically the same construction, practically the same occupancy, practically the same protection, but the schedule charges were determined by separate bodies of authority, equally of good insurance ability and noted for their sane considerations, and yet this is what occurred, one showing decrease for co-insurance clause of about 6 per cent., the other decrease for co-insurance clause of about 45 per cent. If this was confusing to an insurance mind, what was it to the assured? The old rating systems, even with the use of schedules, with charges for deficiencies and items for credits given for various superior conditions, were very unsatisfactory, from the fact that the question as to whether or not this or that risk should have a certain charge or credit was left to the insurance authorities in charge; there was nothing that compelled a charge against one assured because they charged some other assured for a similar defect; they could make their decisions as they chose, and they could even rescind a rate entirely. Another objection to the old system was that the different rating authorities in different parts of the State used different kinds of schedules for risks of essentially the same hazard. Many risks in all sections were subject to arbitrary flat rates, from which it was impossible to get any promise of reductions for improvements in the property.

The results under the old system were so unsatisfactory that during the session of 1913 Senator Ramsey introduced in the Legislature a bill known generally as the Ramsey bill, for the purpose of bettering the insurance conditions. The merits of the bill were recognized and it was promptly passed by the Assembly and Senate, and hardly a dissenting vote, and became a law on its approval by Governor Fielder, March 18, 1913.

The law, which is very brief, occupying as it does only about fifty lines of ordinary size type, provides: First, for (individual, not collective) anti-discrimination in its mandate that fire insurance companies shall not discriminate unfairly between risks of essentially the same hazard, the working application and a proper grammatical construction of which is that insurance companies must discriminate, but must discriminate fairly.

Second, it provides that any assured has the right of asking to have an investigation made by the office of the Commissioner of Banking and Insurance upon presentation of proper evidence in support of claim of violation of the mandate of the law against unfair discrimination between risks of essentially the same hazard.

Third, in order to establish a basis for a proper working condition to produce anti-discrimination, the law provides that insurance companies must file, individually (before they can make any rate of insurance), schedules showing the system they will use in order to arrive at such rates. The law provides that this system must embody basis rates, charges, credits, terms, conditions, permits, standards and other data necessary for the computation of equitable rates and rules of practice. The legislators, wisely realizing that these necessary requirements, together with the examinations of risks which would be required in order to properly apply the schedules to the risks, in order to produce anti-discrimination, would add very much to the cost of fire insurance, further provide that individual insurance companies may appoint an expert to make these filings and ratings, and that the expert may act in the same capacity for other insurance companies, although the filing must be individual for each company. An insurance company, however, is not compelled to appoint an expert. They can make the filing from their home office if they so desire.

I call your attention to the wisdom in providing for the appointment of an expert. Suppose each company was compelled to make separate filings in order to produce rates for the assured. These rates must be based upon scientific consideration as to fire hazard, and must be without discrimination, each in its own class. They must be scientific enough to produce a profit. Would you care to purchase the policy of a fire insurance company which is purely in a game of gamble; or, on the other hand, do you not demand the policy of a company that is operated upon a profitable and scientific basis? To produce this result it would, therefore, be necessary for each insurance company doing a general fire insurance business to employ a chemist, an electrician, a hydraulic engineer, automatic sprinkler and many construction and physical hazard specialists, with a large number of clerks for this special department, the expense, which must finally be paid for by the assured, would compel a large increase in all rates.

Charles M. Crook, Catskill, N. Y.

The law further provides that every insurer should within ten days after written demand shall have been made, furnish to any insured full information as to how such rate is made up. The law was to take effect the 4th of July following the passage of the law in 1913.

This meant that some one or more persons had a tremendous job in the following four months.

Schedules must be worked out when applied to the risks, must be fair to the insured, and still produce for the insurers reasonably near the same premium income as before.

Some one hundred and fifty companies employed one Atlee Brown, an experienced insurance man, as their expert, and Mr. Brown organized a force of assistants, opened offices in Newark, N. J., with branch offices in various other cities, and began work. He was very successful in making schedules to meet the various requirements.

While Mr. Brown, acting as expert, makes rates for most of the companies doing business in New Jersey, he does not make all of them by any means. Another expert has filed schedules on behalf of eight mutual companies, mostly lumber mutuals. These rates are made up from an entirely different point of view and based on different experiments, yet I found that on seven different lumber yard rates in which I was interested the aggregate of the seven rates made by the mutual companies was 19.67, and the aggregate of the Brown rates was 19.70. Twenty-two domestic mutuals and three mutuals of other States have each filed their own schedules, as has also one stock company of another State.

Understand that the law does not prevent any company filing any schedules of rates that it desires, but these schedules must produce equal rates when applied to equal hazards throughout the State.

The law has now been in operation since July 4, 1913. What has been the result?

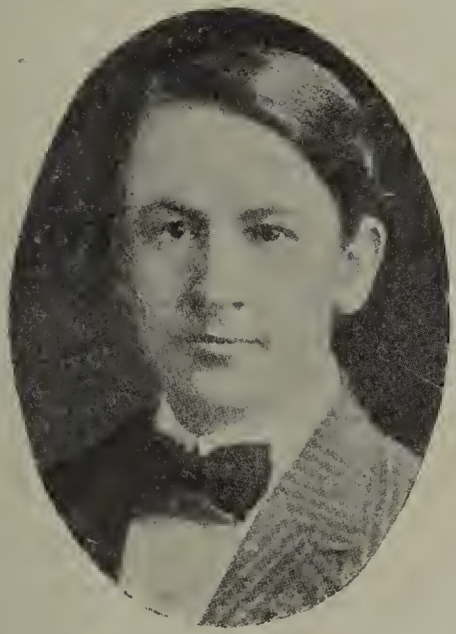
I give you herewith an extract from the annual report of the Commissioner of Banking and Insurance for the year ending December 31, 1913, copy of which book you can obtain without cost from his office in Trenton, N. J., in which he says, in part:

"Although the law has been in operation less than one year, there is ample evidence that it has been of advantage to the insuring public, and it seems safe to say that as time goes on it will be found that it will do much to improve insurance conditions in the State and be a benefit both to the public and the companies. In any event, it certainly seems that there is sufficient merit in the act to permit it to remain unchanged until it has been given a fair trial."

And again in his report for 1914:

"The returns of fire business in New Jersey show an increase in risks written of $25,417,199, and a decrease of $10,854 in premiums received. Fire losses incurred were greater in amount by $929,100, the ratio to premiums received being 55.60, as compared with a ratio of 47.48 in 1913. The average fire premium charged was .88177, the average for the preceding year being .90090."

The average rate of the State of New Jersey reported by the Insurance Commissioner is the lowest average insurance rate I have been able to find in any previous year in the insurance history of the State. It is true that some rates are advanced; it is true that many rates are reduced. It is the natural result of anti-discrimination. Those who have had the benefit of unfair discrimination heretofore cannot have it repeated. The law in no way anticipates that insurance rates should be lower. Some people, however, have that idea in their minds. Rates cannot be reduced continually, but in the readjustment in order to produce anti-discrimination it just happens that there is a reduction in the general average rate of the State. What more can the public ask? In fact, is the public asking for a further reduction? What manufacturers, what large merchants, what large payers of insurance indemnity are requesting a change in the law? Practically none. Ask the Insurance Commissioner.



E. R. Michel, Slidell, La.

While it may be true that this present Anti-Discrimination Law is not perfect, yet its imperfections disappear when you compare this law with the insurance law in any other State. Other States have sent for the law in this State. It has been highly commented upon, and by many is thought to be a law that is hewing the way through ignorance to show the other States how to follow.

A further result has been that as many of the insured began to become acquainted with the law they began to say to the agents: "Get me a copy of the schedule rating on my building. I want to see what I can do to lower my rate," and I think that some of the agents are beginning to see the handwriting on the wall and are now endeavoring to "get there first" by showing their customers how they can reduce their rates, believing that it is wise to do this even if they reduce their commissions by doing it. Possibly the agent hopes that the customer will be grateful enough to give him some business which formerly he had placed elsewhere.

Let me give you a personal experience as to reducing rates:

While we are brickmakers, we have for years operated a sash and door factory in connection with our retail lumber business in Atlantic City.

The rate on the mill for twenty years or more was 5 per cent., and we could not get it reduced. We considered the installation of an automatic sprinkler system, but could get no definite promise as to what the rate would be after it was installed. Under the new law we asked for and received a schedule rating which still showed a rate of 5 per cent. It, however, showed that if we would put in some metal skylights and enclose our stairways, the rate would drop to 4.35. We spent about $150 in doing this and got the reduction.

We then took up the automatic sprinkler question, and found that the installation of such a system would reduce the rate of 4.35 on the mill (a frame building) to 1.20 and the rate on the office building and warehouse nearby from 3.50 to 1.05. We installed the system in both buildings at a cost of about $3,500. We increased our amount of insurance about $10,000 to bring it up to the 90 per cent. co-insurance required, and our premiums are $700 per year less than before.

This is a practical illustration of how the system will work out, and in numerous cases, although the reduction is not likely to be so great as in our cases.

If an insured sees on his schedule that a certain condition as construction of his risk costs a certain amount each year in premiums, he is likely to try to remedy the condition and get the reduction. Under the old system of a flat rate no such inducement was offered.

The point which interests us particularly is the working out of the schedules with regard to brick construction. Let me illustrate:

I have a schedule here for the rating of warehouses, etc. This shows that the standard construction is for walls of brick, stone or reinforced concrete of not less than from 12 to 24 inches according to the height of the building.

If the construction does not conform to this standard, specified amounts are charged according to the variation from the standard, until, for a construction using a combustible material a charge is made of 8 cents for each side or end wall, or a total ordinarily of 32 cents on the rate.

I believe that if business men knew in planning a building that construction of this sort would make a permanent charge of this amount on the entire building and contents, they could easily figure that, considering the reduced upkeep cost, it would pay them to go to the slight extra expense of brick walls.

One great advantage of the system of which I am speaking is that anyone planning a building can, by going over the proposed plans with a competent insurance man, determine in advance exactly what his rate would be.

I know of one case where the owner did that and took advantage of so many opportunities to reduce his rate that the rate as calculated was only 7½ cents per 100.

From what I have seen of the working out of this law, I believe it is the most fair and businesslike, and most likely to bring about improved conditions of fire risks of any law of which I have any knowledge.

It is, I believe, fair to the insurance companies because it permits them to write business at a rate which is fixed by their expert as being a fair rate according to the particular hazard, and permits them to reduce to a minimum the cost of making rates by employing one expert.

On the other hand, it assures the insured that for the same hazard the rate will be the same in all parts of the State, and gives him the right of appeal to the Commissioner of Banking and Insurance if he thinks he has been discriminated against. It also gives him what seems almost impossible, i. e., competition without discrimination by the filing of various companies of different basic schedules which are competitive. It also shows the insured what his premium rate is as it is and where it can be reduced often to a moderate cost.

Altogether, the new law is, I think, working out very well, and I trust that our legislators, whose zeal is sometimes greater than their knowledge of the subject under consideration, will permit it to remain unchanged for a few more years, so that it may have a further chance to prove its usefulness. (Applaue.)

President Deckman: The chair regrets there has not been a larger audience to hear this ably prepared paper. It is worthy of discussion and consideration. Discussion will be opened by Mr. J. W. Robb, of Clinton, Ind.

Insurance Rates.

J. W. Robb, Clinton, Ind.: Mr. President and Gentlemen of the Convention—I had the pleasure of reading this paper before Mr. Somers presented it. There were a great many things in it of interest to me, and there were many things in it that I was somewhat surprised to know. We have in our section of the country very different conditions from those referred to in this paper, that is, we have a National Fire Prevention Association which is working along the lines of betterment of buildings and attempting to reduce our rates according to the kind of a building we build, and this is being done largely by an association of fire insurance companies. In the states of West Virginia, Ohio, Wisconsin, Michigan, Indiana and Illinois, we have used what is known as the Dean analytical schedule for basic rate, and this is promulgated in these states and has been in use in these states since 1906, so that every man makes his own rate absolutely. The general analytical schedule goes so far as to charge you one cent for some particular defect or to credit you accordingly for an improvement and finally results in each insurer making absolutely his own rate. Mr. Somers referred to the thickness of the wall. As I remember in the building five stories high, your wall must be twenty-four inches, and from that it decreases four inches per story until up to the fourth story, or something like that. These things are all taken into consideration. The same is true of fire walls. It used to be a very common thing for a man to stop his fire wall at eighteen inches when it should be twenty or thirty inches, practically costing him nothing to make it standard and increasing his rate by making it non-standard. A neighbor of mine had a building facing a street in one direction and back of it was a livery barn endangering his whole building by this exposure, but by building a fire wall on the rear of his lot facing the livery barn, he decreased his own insurance enough to pay for that fire wall in two years, not only for the labor, but the brick and the entire cost of building the wall.

C. C. Barr, Streator, Ill.

That is the reduction in his rate extended his insurance three years, showing the advantage of using this same precaution. In Pennsylvania the rate slips are printed and show upon the slips themselves the decreases for improvements. That is not done in our section, but the same schedule Mr. Somers shows has been, and you can apply for it or have the insurance apply for the schedule. It is common practice for the energetic agent to be constantly showing his client the advantages he can receive by making improvements, thus keeping in advance of his less enterprising competitor in attempting to secure some of the business. Most architects when drawing plans for buildings of any size, where the insurance becomes a fixed charge upon that building and is worthy of consideration submits the plans to an insurance man or to a rate making bureau. In these states that I speak of there is but one rate making bureau and the companies get their rates from that bureau. They, of course, pay all the expense of their traveling men for inspection and that is paid by the insurance companies. Then, too, these rate slips from the rate making bureaus are not allowed to combine in our state. All the companies cannot get together and make a rate, but they can employ a bureau, that is, they can get services of the bureau that will distribute these rates to any company that wishes, though the rate is really based upon that schedule so that everyone has practically the same rate. As I said, the owners of property make their own rates. A few years ago it was unusual for our coal operators to build anything but metal stacks, thinking the mine would work out before they would get their value out of a brick stack, but today there is not a mine in our section that does not put up a brick stack and they find it a good investment. I am inclined to think that in the last few years we have had too much legislation on a good many subjects. I think the railroad companies have convinced us of this. We are constantly having laws made that become onerous to us; there is now upon our statutes a workman's compensation law and there is a question as to what is going to happen to all of us. A few of the companies have had their rates increased by the compensation act, but with the coal operators, it has almost put him out of business, so far as carrying insurance. The rate is being promulgated now at about $4.90 on a hundred dollars payroll and they are having to organize mutuals to carry their own insurance in order to operate at all. There probably will come a time when this will be changed and the rate will adjust itself. The energetic insurance agent and the insurance man who understands his business, I think, can be of some value to us. I think it is necessary sometimes to protect ourselves by laws. We are privileged, I presume, in this gathering, to talk about corporations. For practically nine-tenths of us are corporations. Sometimes corporations are greedy and do press us in some things, but we have enough competition in the insurance business to take care of these things. I think under conditions that Mr. Somers speaks of in his state, it was a very grave discrimination that was practiced and one that could not be practiced in our section of the country, because, if they did that, the companies would lose their business. (Applause.)

President Deckman: Is there further discussion on this paper?

Secretary Randall: As most of you know, some three years ago there was established what was called an Inter Insurance Bureau at St. Louis, with which my name was connected at that time. I went into the proposition as originally presented to the convention at Chicago and thought it was a good thing for the brick manufacturer, and would permit a saving of a good percentage of the premium. It soon developed that some of the states that did not recognize inter insurance had laws that were almost prohibitive. For instance, in Ohio there is a tax of 10 per cent. on premiums paid to insurance companies not authorized to do business in that state, with a severe penalty for those who do not report such insurance policies. There are only a few states that recognize inter insurance companies. These facts and the added fact that the manager of the Bureau, Mr. Campbell, and I agreed to disagree, caused me to withdraw from the company. Inter insurance, when properly and honestly managed, is a good thing in such states as recognize that form of insurance. Among them, I believe, is Kansas, Missouri and perhaps one or two other states. The inter insurance plan is somewhat the same as mutual insurance which has proven very successful among the great mills of New England. Brick manufacturers, if they could unite on such a scheme in conformity with the laws of the state, would undoubtedly profit by it. For one reason, namely, it would lead to better methods of construction of brick plants, because only first class plants could be considered. That is, plants safeguarded by proper methods of construction, the use of more brick and less wood in the buildings and such other safeguards as make a risk less hazardous.

Mr. Robb: My notes got a little mixed. There is one thing I want to call attention to. In our section of the state, and also in Illinois, there are a number of builders of sprinkler equipments and they make a proposition to you that you can put in their equipment and pay for it in the saving in the rate. It is a little higher than the cash rate, but they will build you at your factory and equip it with the sprinkler equipment and you can pay for the latter with the savings of your yearly premiums, adding about six or eight per cent. for what they would equip for cash.

Mr. Gregory: The disadvantage in the matter of inter insurance, as I understand it, is to take advantage of the co-insurance you have to insure your buildings for the full value of the building and then bear a share of the loss in case there is a loss. There is a disadvantage in that which I want to point out to you. On the old line plan, if your building is partially destroyed, you get your full loss. If your buildings are constructed from brick and fireproofing materials and takes fire, if you are insured on the old line plan, you can get full value on your loss, while if you are insured on the co-insurance plan, they get the advantage of the fireproofing portion of the building you have constructed.

R. G. Eisenhart: I am very hoarse and it is very difficult for me to speak, but I think my friend Gregory is wrong in the co-insurance you are compelled to insure 80 per cent. of the value. The co-insurance is all right, provided the man is insured up to 80 per cent. of the value, and the only way he can determine what his value is, is to get a good competent man to make an estimate and a real inventory. If you do not do that you are going to have a little picnic before you get your insurance adjusted. I passed through a fire and I got my insurance all right, because I had a full inventory of my plant and there was no question as to my loss.

Hubert Somers: When the automatic sprinkler rates are made they are much lower than any other rates and it must carry eighty or ninety per cent. If you have a loss you will get eighty per cent. of the loss. If you carry less than that you will get a similar proportion of the insurance. We talked up the sprinkler rates and thought we had to have it. We have had a company make us a complete inventory of the buildings and the contents, which cost us $300.00. We have this inventory now in our files ready for use any time, and I think that is the proper way to handle a thing of that sort.

Leo Childs, Findlay, Ohio: I am a good deal interested in this insurance proposition and I think, from our own experience, if the average brick manufacturer would ask for an itemized statement he would get a good deal of information. We were paying a $3.00 rate and on investigation we found that our base rate, according to the bureau, was $1.25, the balance was additions added for lack of improvements which we did not have, and by analyzing our rate as given us by the insurance company, we were enabled to decrease our rate to $1.55, and there is one thing that we must not overlook in decreasing that rate, you also get the benefit of any protection. We found that the bureau called for a fire extinguisher, one for every so many square feet and called for so many feet of hose. We reduced our rate to $1.65, and then the insurance companies reduced it to $1.25. I think if the average manufacturer would have his plant itemized and see what the various items are he would be able to reduce his insurance materially.

B. H. Richards, Edwardsville, Ill.: On this insurance proposition, in event of a partial loss, say a loss supposed to be $1,000 and you were carrying an insurance of 80 per cent., would a fellow get $800?

R. G. Eisenhart: In the case I had several years ago I got my full loss. You are obliged to pay a premium up to 80 per cent. of the value.

President Deckman: We would like to continue the discussion on this question indefinitely, but so many of you failed to come up here at 9:30 that we are obliged to cut the discussion short. We will now hear from Professor Edward Orton on "Recent Progress Toward the Standardization of Building Brick."

Professor Orton presented a very instructive paper illustrating same with tables, charts and stereopticon views. He requests that the publication of the paper be deferred until some of the tables and data can be further perfected.

President Deckman: We will now listen to a paper by Mr. L. K. Brown, of Zanesville, Ohio, on "The Commercial Side of the Brick Business."

THE COMMERCIAL SIDE OF THE BRICK INDUSTRY.

BY L. D. BROWN, ZANESVILLE, OHIO.

Gentlemen of the Convention:

I feel that in the matter of service as a brick manufacturer I am still an infant in arms, being carried about with new and wonderful visions rising before me at every turn and with each day. It is only of very recent years that I was put into the harness and shouldered the vital and serious problem of making brick, which would stand to the hard test of various arguments. Consequently, I am considered a pupil of the new school, and in view of my immature years it hardly seems fit that I should be here trying to tell men, who have seen many years of brick service campaigning, how vital questions of the industry should be met. However, my previous experience in other walks of life have given me a viewpoint which I possibly would not have had if I had spent all my days at brick making.

My subject as outlined is "The Commercial Side of Brick Making," and I think that primarily the commercial side of brick making starts at the source of supply and follows through the delivery and final service, be it either in wall, pavement or furnace. For, it depends on the cost of manufacture and the cost of the sales department, whether or not the company will meet its bills and competition, which as each year goes by becomes more stringent and acute.

A. V. Bleininger, Pittsburgh, Pa.

The brick industry, as you all know, has shown sudden rise to life in late years after many decades of lethargy, wherein chaos and haphazard methods reigned supreme. Now Mr. Brickmaker has risen from this sleep and is looking forward into the great years to come, and says to himself, if he is wise and progressing: "I know we are doing well, but we must do better and bring forth a better product, and I know we can by persistent effort find a better way to perform operations which seem almost simplified to a minimum." Herein lies a great secret of prosperity, productivity and final recognition before the eyes of the world—simplicity—for simplicity means reduction in cost of operation and gain on time of production.

The commercial side of brick industry is one of two sides. On the one side lie the factors of success and on the other the factors of failure. Manifestly it is unnecessary to suggest to this body of intelligent and experienced brick manufacturers of the United States any of the factors which contribute to the failure of the paving brick industry. They are numerous enough, so much so that eternal vigilance is necessary that they may be guarded against. The man who imagines that paving brick manufacturing is one which is free from trials, tribulations and difficulties is to be pitied if he is in the business. He cannot escape the calamity that will surely overtake him.

What, therefore, is possible of suggestion for the other side—the factors of success—which are equally numerous and difficult of understanding, and still more difficult of discernment and are the things with which we all ought to have a more familiar acquaintance, and about which our most careful inquiry should at all times be directed.

Wherein are found the factors of success in the industry?

Economy of manufacture, without which you can not expect a profit.

Quality of production, or customers will be wanting.

Integrity which begets confidence, or your representation will not invite favor.

Publicity—Brick, like every other good thing in this world, can not be hidden under a bushel and expect any notice whatever from him who would buy.

You will see at once, therefore, that the commercial side of the industry calls for the greatest wisdom of human knowledge. The higher the requirements the greater the persistence necessary for effectiveness.

The commercial side that spells success means the greatest efficiency. In its ultimate measurement the successful side of the industry is indicated by the amount of profit seen in your bank balance.

"Efficient Salesmanship!" Truly a high-sounding phrase, much in the public thought at this moment. Books are being written on this theme, and so-called "experts" are almost vociferous in their advertised pleadings to adopt their system as the royal road to guaranteed succees. What is it? Men of affairs, producers intent on finding a market for their wares, in whose company I find myself at this time, are not given to flights of fancy. They deal in the common-place rather than in star-gazing. Results, results and yet more results is the practical longing of their expanding visions of trade.

For the purposes of this paper, I assume that Salesmanship rests upon three cardinal, let me say, three fundamental principles—knowledge, integrity and industry or application. There may be other factors, but in my experience this trinity provides a substructure upon which one may fairly hope for success if he builds wisely, persistently and symmetrically. Knowledge! A constantly expanding intimate knowledge of the thing one has to sell. If that thing be so familiar an object as a paving block, then of its component parts, the process of manufacture, its tensile strength, its power of resistence to the ceaseless grinding of traffic, in a word, all there is to know of that marvel of surfacing material is modern road building. None of these factors are hidden to an enquiring mind. No one need grope in the dark. Tests, more or less scientific, but tests which establish the truth as unmistakably as is possible to human endeavor and investigation, are at the command of the salesman, and he should know the truth of his assertions, if he is ambitious to be reckoned "efficient."

The salesman is also bound to meet the practical question of economic values. He who talks paving block need not, indeed should not, criticise or depreciate his competitor who stanchly stands for some other type of road construction. But he must be prepared to establish the wearing qualities of the product he would place in open competition with his fellows and by concrete illustration establish his position as to real and tangible value. This brings me to a case in point in my own city. Zanesville has long experimented with various types of road building. I may be excused for the suggestion, therefore, that naturally I have been a student of the commercial as well as the manufacturing side of the paving block problem. I will not presume to deal in the expression of opinions for opinion's sake, for I have no pride in personal convictions aside from their demonstrable value.

Twenty-eight years ago the first venture at brick paving was made in our city. The public at large was not slow to express doubts as to the feasibility of the venture. But the experiment, if you will, was persisted in and a short stretch of a block or two was covered with the best material then known, a brick but little better than the hard burned building material. The bricks were laid on a sand cushion, and a little later the entire thoroughfare was covered with a brick pavement. Under the unwise policy of repairs then in vogue, the digging-up and replacing proved costly and destructive, but under these most unfavorable conditions, the original paving lasted twenty-seven years; its life might have been prolonged so far as the wearing surface was involved had more care been taken in replacing the bricks after the intermitting repairs were made.

In the meantime those who believed in brick roadways continued their experiments, as did the engineers in the development of plans for substantial construction. Last year this same Main street was repaved and it is to the cost of this improvement I wish to direct your attention, dealing only in round numbers. The entire length of roadway is twenty-nine hundred feet and the average width forty feet. The surface, including all intersections, is a little less than fourteen thousand square yards. The sub-base is of concrete, extending from curb to curb, the curbs being of concrete and very strong. The Burton-Townsend paving block was used for the pavement, the blocks being slushed with a mixture of concrete well brushed in. The total cost of the pavement was a trifle over thirty-one thousand dollars. Bonds to that amount were issued bearing interest at the rate of five per cent., to run five years. A part of the cost was paid by the Ohio Electric Railway Company and the intersections charged to the municipality. Now let us assume that the entire cost including the interest charge was assessed against the abutting property owners. With a total frontage of fifty-eight hundred feet (both sides of the street) and with an average of twenty feet to each business house front, we have more than two hundred fronts against each of which, is levied a total cost of about one hundred and seventy-five dollars for a pavement as smooth and substantial as can be made of any material used in road building. But this is not all. It is conceded that this pavement must continue in its original condition for a period of fifty years. Thus, for less than four dollars a year, the owner or occupant of a twenty-foot front on this busy avenue of trade enjoys the comfort and cleanliness of a road-bed for all practical purposes as solid as the long famed Appian Way. Take another angle if you please. The investment as I have shown, assuming that the abutting property is taxed the entire cost, about one hundred and seventy five dollars, the interest charge per annum at five per cent. would be eight dollars and seventy-five cents. This is the commercial side of that improvement, which can be duplicated in almost any city in the central west. Salesmanship is charged with the duty of presenting just such facts. Permanency, solidity and smoothness of the surface are the factors in the building of roadways of greatest consideration, but we must not lose sight of that other mighty factor, the life of the improvement. The first cost is not and ought not to be the controlling and dominating consideration if we are to attain to that ideal of future development in public and private affairs so much in the minds of our progressive citizenship. The prodigal waste of the hand-to-mouth systems, or rather want of system in road building, happily now engages the attention of the business world and we may reasonably hope for better things in the very near future if we continue soberly to address ourselves to the solution of problems which vitally and profoundly affect the future of this great republic.

L. K. Brown, Zanesville, O.

Economy of manufacture must receive constant attention from the very inception of the endeavor contemplating the manufacture of brick. The location having reference to cheapness of fuel, quality of raw material and market facilities are prerequisites. If the single item of water supply is lacking, that alone will prove a handicap—a continual menace to the plant's success and ofttimes impossible of correction. If the raw material possess any element preventing an economic delivery from the bank to the dry-pan or crushing machine, it may prove a source of complete disaster.

A few hundred or even a few thousand dollars expended in order that you may know the quality of your raw material is an absolute necessity. Failure to know the quality of your raw material in the beginning has many times driven the original investment into common stock, the worth of which is reduced from month to month, and finally it disappears altogether.

The location must possess inherently marked advantages, including not only a large territory, well ripened for the probable use of brick, but freight rates necessary to make deliveries with equal advantage with other factories producing similar products.

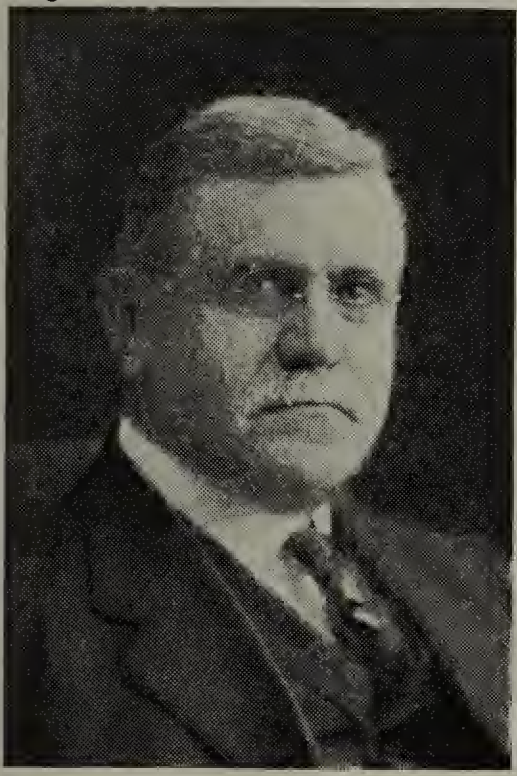
When all of these features have been fully considered and determined upon, then come the plans for an economical production. It means the adaptation of machinery that will not only properly and economically perform its functions, but it must be so placed in relation to every other part as will bring to a minimum the labor incidental to the respective operations of the machines. The plans, the layout, is one thing and a big thing, but it is not the only thing by any means. Various machines must have a proper relation to the work they are expected to perform. Nor are the plans or the proper machines within themselves sufficient. They must be placed mechanically correct. A machine, a shaft or even a bearing out of alignment will always prevent a maximum day's production. A belt that will not stay put is adding to its own expense many fold.

The proper location, the proper plan, the proper machine and its mechanically correct placement are the only installation of equipment. They must be kept constantly in order. The labor element must be properly adjusted, and the whole must be maintained at its maximum efficiency.

The clayworker of today is waking from a long sleep. A period of lethargy has preceded his awakening. Obsolete methods are rapidly being displaced by economic devices and systems for the manufacture, handling and selling of his output.

In no other department of the manufacture of clay products has the fact of laying aside our forefathers' methods been so marked and distinctive as in the drying of the ware. Drying has progressed from the decadent method of open air drying, trusting to nature's will, through various stages up to the present efficient systems whereby waste heat from cooling kilns is employed to dry the ware. Even waste heat, with its underlying principle of efficiency and economy, is stepping forward as the days go by.

We will not endeavor to go into a history of drying and attempt to show how each system of drying fostered some decadent method, etc. We know this has happened, and will hold ourselves to present-day methods and future possibilities in the waste heat field.



Will P. Blair, Cleveland, Ohio.

The progressive tunnel dryer of today, with its method of supply and principles of operation, is familiar to all who are acquainted with the clay industry. Naturally there are on the market variations, or rather designs, which have an occasional distinctive feature, but basically all designs of the progressive waste heat dryer are similar. These additional adjuncts have, however, proved food for thought, and in them are found possibilities for future development.

From the present indications it will only be a very short time when the type of kilns and the methods of burning now in use will be obsolete, for already in the hands of our leading and most eminent engineers we find the imperfections that prevailed in the past in the gas producers and the gas fired continuous kilns being worked out so that a wonderful possible reduction in cost at this end is already being demonstrated, a fact which will put the burning of brick upon a much more economic and scientific basis.

Efficiency in every step of production must always have a proper measurement which will expose the least curtailment of economy, and the only instrument by which this information can be accurately ascertained is a complete record of the cost of every single step. The cost of the shale delivered in the factory; the cost of grinding and reducing to a stated condition for the pug mill; the cost of making the brick (operation of the pug mill, the brick machine. the represses); the cost of drying; the cost of burning, drawing and sorting; in fact, the cost of each one of the steps respectively. By such a method and such a method alone can the incipient destructive work due to carelessness be detected, which frequently ends in fire, breakage of machinery, loss of limb and life, and finally a rupture in discipline, which must in the end break down the element of order and lead to ruin.

If the proper cost of operation of the pug mill and brick machine from the time it receives the screened clay to the output of the brick on the dryer car ready for the dryer is $1.75 per thousand, but in spite of this the cost of yesterday and day before ran up to $2.01, something is wrong in and about the operations required for this step in production. An inquiry, and investigation should be directed at once, the spot where the trouble exists is located, and it can therefore be easily remedied. But if you only know that your brick cost $11.89 loaded in the car, inclusive of all the steps from shale bank to car for shipment, you are practically helpless to remedy the cause that is eating up your profit.

High quality of production is, and will remain for many years, a great factor in the success of the paving brick industry. There are many refinements in the preparation of the raw material, in machinery operation, drying and especially burning, about which we have had little, if any, accurate information. Some manufacturers are heard to remark that to get his quality he must grind coarse. How coarse? Or grind fine. How fine? Some say that in the earlier part of the burn your fire must be the oxidized fire, other parts a reducing fire. But where and when and at what stage should these fires begin and end respectively? Who knows? I regret to say that there are many technical and refined investigations to be made yet, in order that we may be relieved of many uncertainties that hang like a cloud over the industry. The paving brick manufacturers are not so blind as to act in matters of the highest importance to themselves, through the influence of superstition, but they are compelled very often to waver amidst doubts, which means but to act upon a mere guess. It will be a bright day for the industry, indeed, when every step of manufacture is fortified with a well-founded reason based upon scientific knowledge, knowing the causes which affect results.

"Honesty is the best policy," is a proverb, a philosophy, a rule of action that has often slumbered in the civilization of the past; but no one can deny that its revivification is the red blood coursing in the veins of business activity today. It is seen in the motto of the Associations of Advertising Clubs in America, "Swat the Lie." It is felt in the disposition of you and I to say away from the merchant who overstates in his appeals and inducement to buy. Honesty and fair dealing with the public will create in turn from that public, not only a disposition to buy, but to buy at a price, giving the manufacturer a reasonable profit.

Granting to our competitors the ability to manufacture economically, there remains to us the advantage of the higher quality; and, granting our competitors equal integrity, we must acquaint the public with the advantage we so conscientiously believe our material possesses. No one is going to tell the story for us. Every successful trade and industry in this country has its organized trade association to advocate and proclaim its common cause. Through these associations the public becomes acquainted with the uses for which the products are best adapted. They become acquainted with how to use them. No longer can the manufacturer's interest remain within the walls of his factory. He must make common cause and develop a mutual interest with that of the patron. He cannot be allowed to say and is not allowed to say "My goods are all right; it is up to you to use them." Quite to the contrary, he must first thoroughly understand the value of his own goods and how the greatest possibility of value is reached in the use of his goods, and he must convey that information to his patrons.

These well-known principles of commerce are vital, and fundamental to success. For long years we have had the slogan, "Competition is the life of trade." I prefer that other term, "Co-operation leads to enduring life in trade." Thus in later day American life, the best thinkers are promoting organizations dedicated to the holy thought, "Live and let live." The National Brick Manufacturer's Association, with its affiliated bodies, was builded on this sure foundation, and has become a potent force in this mighty industry, destined to take high rank in the economies of rural and city life. To be a vital force for good, there must be cohesion, unreserved loyalty to the principles we profess and expanding interest in individual support of the objects set forth in the constitution to which each member has voluntarily subscribed.

To my mind, the field is white unto the harvest. Great possibilities have unfolded and are unfolding, bidding us to go in and possess the land. Heeding the principles which dominate the markets, not only of our land, but of the world, and to which I have sought in simple language to direct your attention, it requires no stretch of imagination to believe that our great industry is only in its infancy, and that within the next decade we shall experience a volume of trade not to be bounded by the vision of the most optimistic.

With economy of manufacture, quality of production, the market field cultivated with energy, intelligence and integrity, the commercial side of the brick industry will insure its success by the profit found in the bank balance. (Applause.)

President Deckman: The chair would be delighted to invite discussion on this paper, but on account of the pressure of time such discussion will have to be deferred.

President Deckman: Just a moment, gentlemen, before we adjourn. I want at this time to appoint the Committee on Resolutions, as follows:

Committee on Resolutions.

Warren Griffiss, Baltimore, Md.
D. B. Potter, Clarksburg, W. Va.
Wm. Wreford, Detroit, Mich.
A. R. D. Johnson, Raleigh, N. C.
Fred Talbot, St. Louis, Mo.
Levi Marshall, Horseheads, N. Y.
E. H. Michel, Salmen, La.
M. C. Viele, North Adams, Mass.
Joseph Moulding, Chicago, Ill.

The members of this committee will kindly report through the chairman for such action as may come before them.

Will P. Blair: I just wondered if there was going to be an opportunity to say something about Professor Orton's paper.

President Deckman: We lost an hour and five minutes this morning by reason of the absence of our audience and it is absolutely necessary if the members desire to discuss these papers that may be presented from time to time that they be here so they open our sessions promptly on time. Professor Orton himself has a luncheon engagement at half past twelve and we cannot keep him here beyond that time. The only remedy for these matters is that the members come promptly into the convention room when the time for the opening of the session arrives. This is severe criticism, I know, but it is the only business method.

H. B. Henderson, Columbus, Ohio.

Will P. Blair: I desire to say one word and that is, that if there is an opportunity this paper ought to be discussed because it is a paper that has more to do with the vital interest of your business than any other paper that will be discussed at this convention. I think it should be discussed more than any other paper to be presented.

President Deckman: As a matter of fact, the paper was discussed in a way while Professor Orton was showing the lantern slides for the members were very free to ask him questions regarding the various features. We now stand adjourned until three o'clock this afternoon.

THIRD SESSION.

Thursday, February 24, 1916, 3:00 P. M.

President Deckman: The convention will be in order. The first number on the program for the afternoon session is an illustrated paper on "Clay Testing," by H. B. Henderson, of Columbus, Ohio.

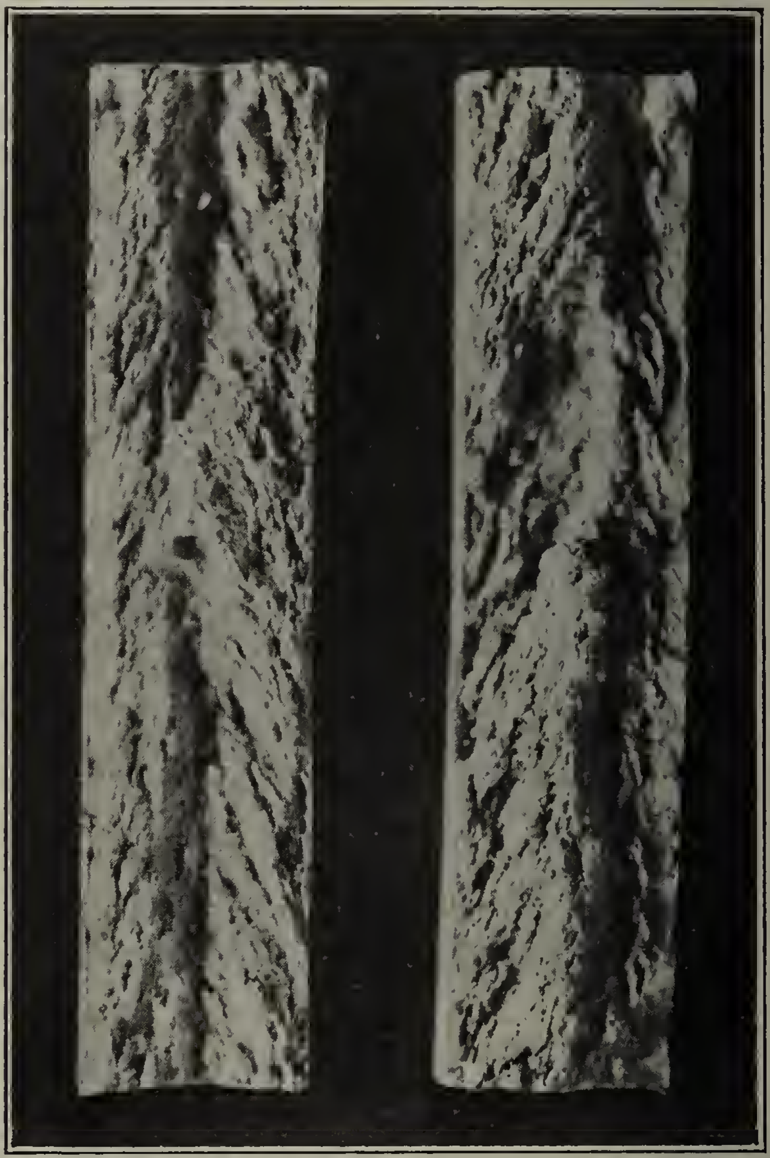
CLAY TESTING.

BY H. B. HENDERSON.

Gentlemen of the Convention:

The purpose of a laboratory test is to determine the qualities of the clay, the troubles which will have to be overcome in the manufacture of any type of ware, the process best adapted to the material, and the possibilities of a profitable business.

With this end in view, we will give some observations from the experience of a number of years and based on the examination of a wide range of materials coming from practically every state in the Union and a number of foreign countries. During this time we have observed many peculiarities in materials used in the clay-working industries. Such observations as I shall present may not be new to all of you; some, probably, will not be new to any one. But why should we concern ourselves about the new things when it is the same old set of troubles that the clayworker is up against whether his factory is located in the United States, Canada, Argentine or Africa. Therefore, our first observation is: The best way to keep out of trouble is to avoid it. Adopt the principle of preparedness by first finding out the limits of your material, then stay within the boundary.



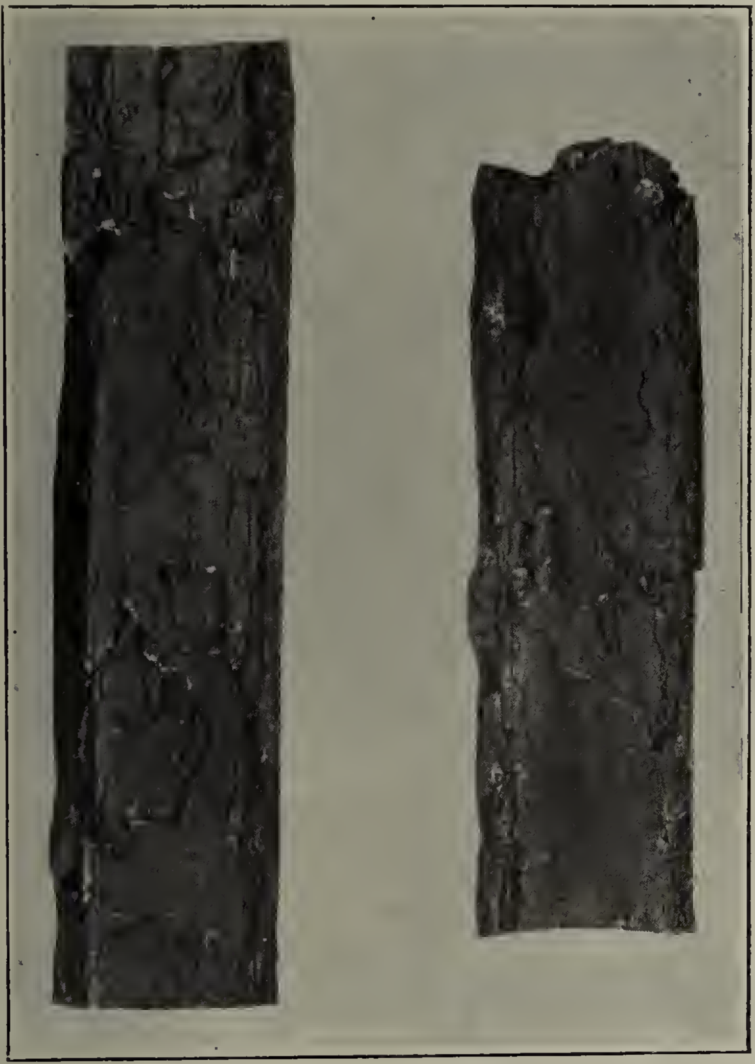
Showing die lamination of a sticky clay.

This paper is limited to a discussion of clay testing, but equally important is the clay sampling. We test the clay that is sent to us, but it may or may not fairly represent the working bed of material. The physical properties of the clay affect the working behavior, and the particular difficulty is lamination, the bete noir of many clayworkers. This is a machine trouble but oftentimes it does not show its effect until the drying and then it is attributed to the drying. Frequently it will not develop its harmful effects until the burning, and then the fault is ascribed to the burning. Lamination, in brief, is simply the slippage of the clay on itself, forming planes or "slickensides" in the clay mass. If the clay is a sticky one and of an adhesive character rather than cohesive, it will stick to the dies, retarding the flow of the clay next to the dies, while the clay within the mass flows ahead. This is die lamination and very common in the manufacture of thin-walled ware, such as fireproofing, drain tile and sewer pipe.

In an auger machine the auger cuts the clay into a spiral, which is packed into and forced through the die. If the clay is lacking in cohesiveness and in binders the layers may not bond together and under the strains of shrinkage in drying and burning they may separate. This is auger lamination, and its seriousness depends upon the degree to which the layers bond together in the burning. Badly laminated ware, such as drain tile in the green state, is simply a series of layers which may be easily peeled off. In the drying, or burning, especially if conducted too rapidly, the outer layer will shrink and crack and curl off, which we call "slabbing."

If the outer layer does not crack and peel off in the burning, it often happens that during freezing weather, after the ware is piled on the yard, the layers are forced off, one by one, and the ware goes to pieces. Ware of larger mass, such as brick, has both die and auger lamination and may be a series of more or less concentric layers from the surface to the center.

The only test for these troubles is a machine test, although often tests are made by simply working up a mass of clay by hand, drying and burning it. Such a test gives some information but misses the difficulties which might arise in machine work. The practical test is to make up ware on a machine, and in the course of this operation determine whether the clay has sufficient strength to stand factory handling, both in the green state and when dry.



Showing die lamination of a weak clay.

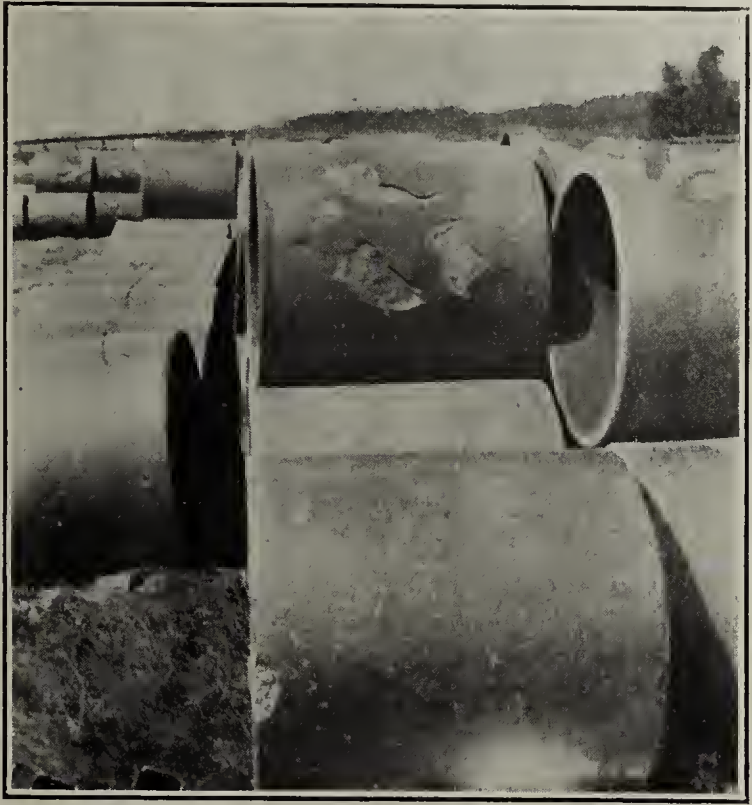
It is not important to determine the degree of strength; in fact, we have no standard of comparison.

A number of methods have been proposed and devised to determine the degree of plasticity, and while of scientific interest and value, yet they do not meet the requirements of a practical test. They may show the degree of plasticity, each method having a range of its own, but the most plastic or the strongest clay because of lamination difficulty may be the least valuable for clayworking.

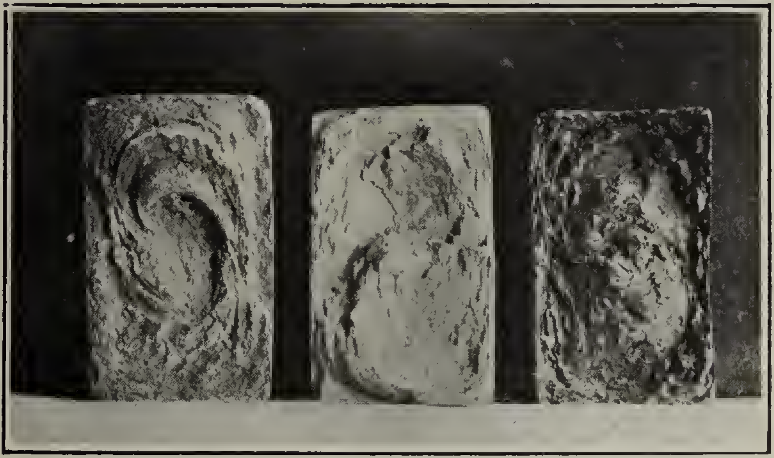
The machine operation alone determines one thing the clayworker wishes to know, namely: That the clay will make good machine ware, and that the ware will be strong enough to stand factory handling. Objections are frequently raised against laboratory tests, but these tests are most important in determining the limits of the material. In this connection, the operator's experience and knowledge of the working qualities and peculiarities of a wide range of different materials becomes most valuable. Only by relating the material under examination with other materials of a similar laboratory behavior and which have later been proven in factory practice, can he form a correct judgment as to the value of the material.

Kaolin or kaolinite is the clay base and is highly refractory. Our pure fire clays are really kaolin, although we do not use this term, but instead call them flint clay, No. 1 and No. 2 plastic fire clay. The melting point of pure kaolin is cone 35 and is lowered with increasing content of other minerals. The most common and predominating mineral associated with the clay base is silica, which is also highly refractory. It sinters about cone 26, but retains its shape above cone 30, perhaps as high as cone 34. Here, then, are two highly refractory minerals, but any mixture of the two is less refractory than either alone. In general, any mixture of refractory minerals will fuse at a lower temperature than the minerals alone.

Silica plays an important part in clay ware manufacture. We use it to overcome lamination, to reduce plasticity, and to counteract shrinkage. Some highly silicious clays swell in the burning instead of shrinking and the increase in size is due to the mineralogical changes in the silica under heat treatment. These changes in volume within our kiln temperatures may amount to nearly 15 per cent. The condition of the sand, fine or coarse, has material effect on the behavior in drying and burning and upon the resulting product. To go into a discussion of the effects in detail would too greatly expand this paper, and it need only be said that in testing the material, consideration must be given to the generally considered inert material sand. Particularly is this true in salt glazed ware, because the glaze is dependent upon the quantity and degree of fineness of the silica.



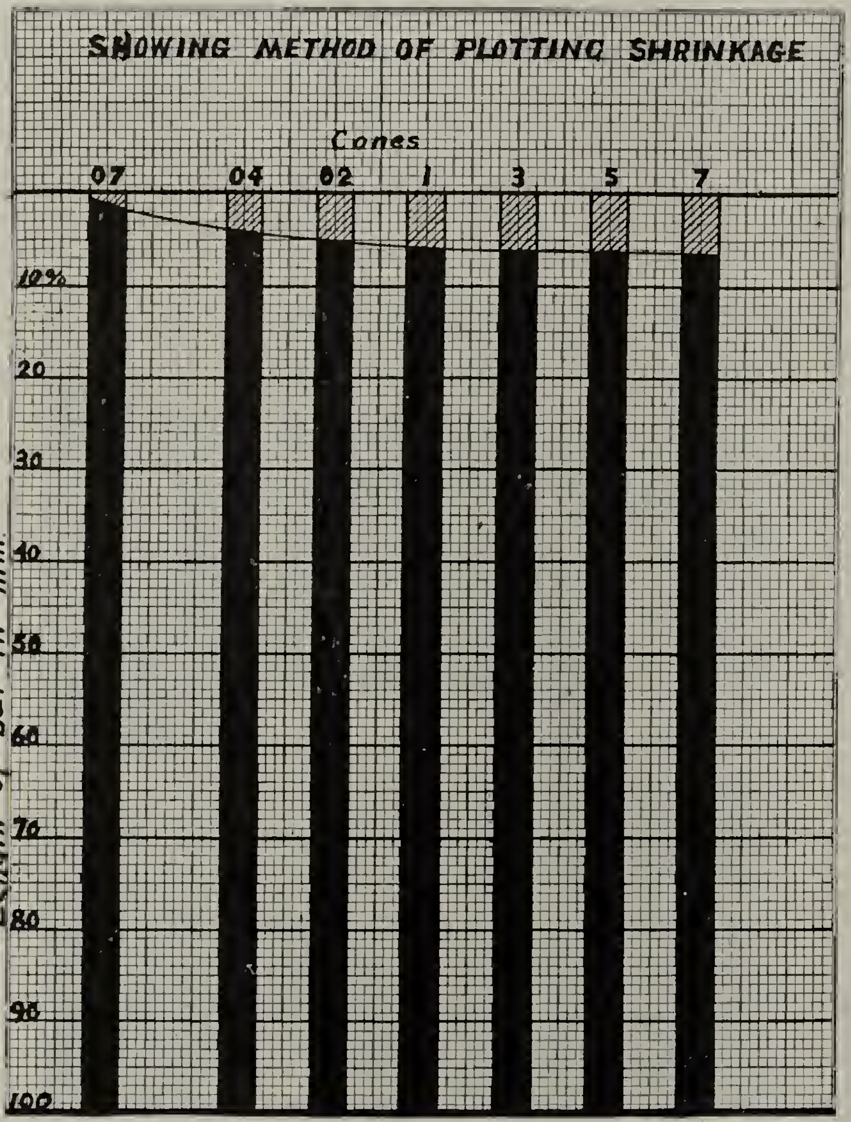
Slabbing of sewer pipe due to lamination.



Machine tests illustrating auger and die lamination.

Feldspar is another common mineral in clay and a more active one than silica, but there are few troubles traceable to it, at least in the more common wares. It is an alkali alumina silicate and is valuable in giving a permanent bond to our burned ware. It fuses from cone 4 to cone 9, depending upon its purity—probably at lower temperatures with other minerals, bringing it within an average kiln temperature for common wares. We count it as a fluxing material and it has the advantage that it acts slowly, thus giving us a safe burning range. It is not necessary to determine the feldspar in making a practical test, except for pottery wares. We are chiefly concerned with the burning behavior and need only look out for those minerals which give trouble in the burning.

Mica is also common in clays, and some clays are largely mica, as, for instance, the micaceous sands of New Jersey, formerly known as "kaolin." Some micaceous kaolins cannot be distinguished by casual examination from kaolin, yet may be 80 to 90 per cent. mica. Its determination is very important in tests for pottery bodies, but of little importance in common clays. It fuses at temperatures above that of ordinary kilns and frequently passes through the fire without any appreciable change. Mica is also an alkali alumina silicate and illustrates the point that chemical analyses, upon which many rely, are of little value. A micaceous clay and a feldspathic clay might have the same ultimate composition and yet behave widely different in the burning.



Lime minerals are very common and very troublesome. The effect of limestone pebbles is well known. The stone burns to caustic lime at about 1600 F. and when exposed to atmospheric agencies, hydrates, swells and pops off flakes of the surface of the ware called "popping."

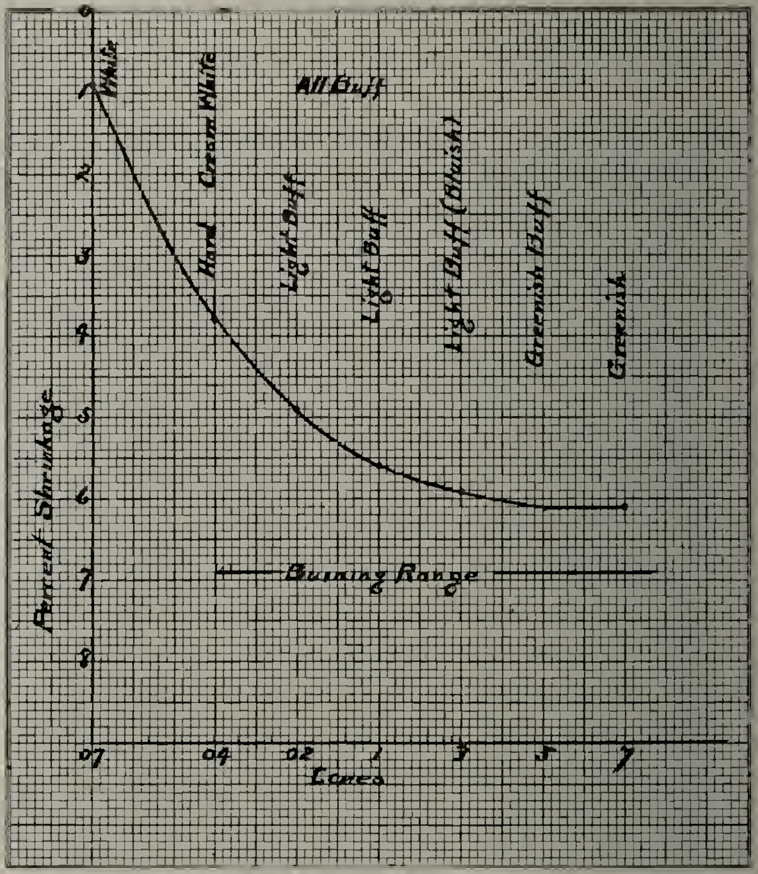
Preliminary test bars, showing popping due to lime.

Clays which "pop" after burning in up or down draft kilns, often will not "pop" when burned in a continuous kiln, especially if the kiln has no advanced heating flue. The sulphur gases of the continuous kiln convert the lime into sulphate which does not hydrate. Lime in an extremely fine condition or as a constituent of a mineral which dissociates at kiln temperatures is extremely troublesome in the burning. It does not act as a flux at a low temperature nor until disassociation takes place and then it seems to act suddenly and completely. A clay bed must not always be condemned because of the presence of lime pebbles, some limestone, likely because they are earthy or perhaps dolomitic, do not cause "popping." The shale beds near Buffalo and Toronto, Ont., have intersatisfied streaks of limestone six to twelve inches thick, yet the ware made from this shale does not "pop." The ware may be soft up to a point when the lime begins to act as a flux, then hardens and begins to fuse all within a range of one or two cones. We consider three cones the minimum kiln range in practical work without excessive fuel consumption, but many limey clays will harden and fuse within two cones, even within one cone range and are impractical in commercial kilns.

The burning range temperature is most important. There are many clays and shales which will burn to a beautiful product at a certain temperature, but fail either above or below this temperature. A sample ware burned at this temperature might induce one to build a plant for the manufacture of the ware, but commercial operations would soon develop the fact that the material was impossible and the plant doomed to failure.

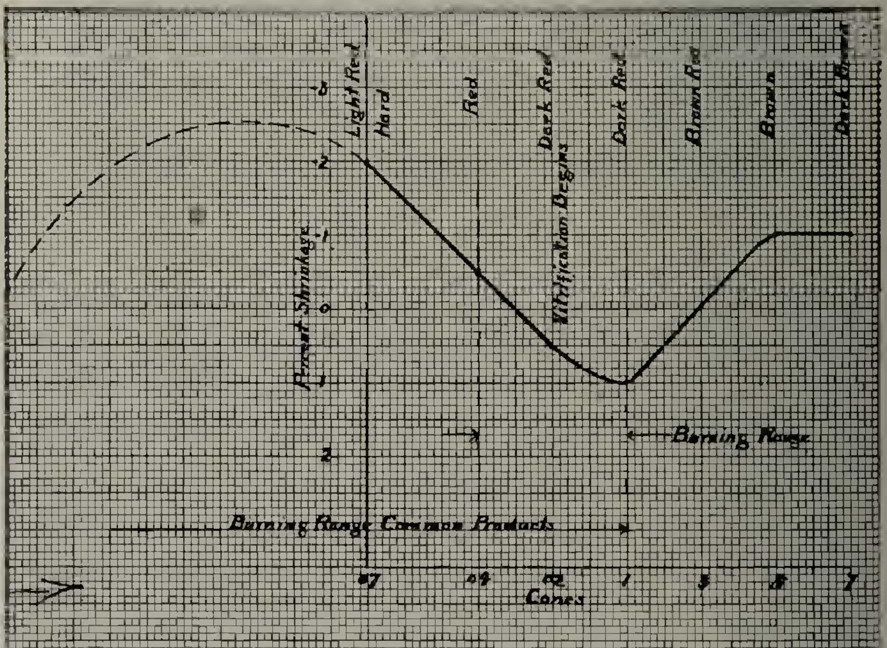
—Heat Treatment Curves

No. 1.



A perfect curve developed from the measurements of a buff burning clay from West Virginia. It starts to shrink rapidly at first, the rate gradually decreasing, and finally stops without any change at higher temperatures.

No. 4.

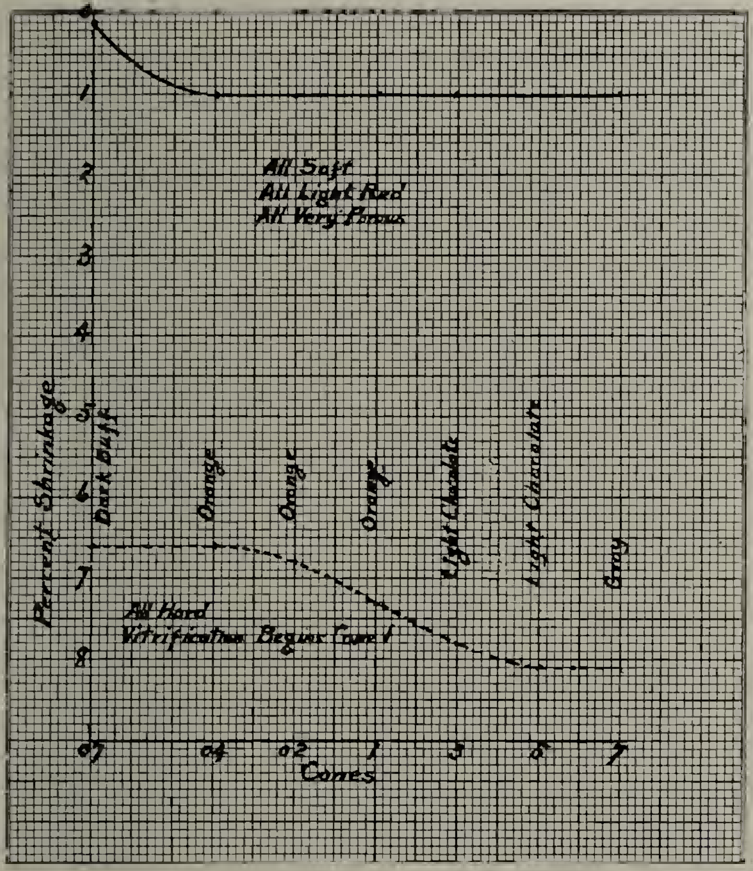


A shale from West Virginia. It evidently contains no lime. The burning range for face brick is limited by color to four cones, but for common brick, etc., the range is frome cone 1 down to cone 07, and we do not know how much below. The dotted extension of the curve is assumed. Somewhere it must get back to the original size. Strange to say, the absorption was low. The features of this material is the swelling at low temperatures, accompanied by fine cracks like crazed pottery. The swelling is not due to failure of the clay by fusion, and is difficult to explain. The true shrinkage is only 1 per cent.

Limey clays often burn red at low temperatures, due to the iron content, but at higher temperatures when the lime begins to act, the iron is taken up with the lime to form a lime iron silicate, which has a buff green color.

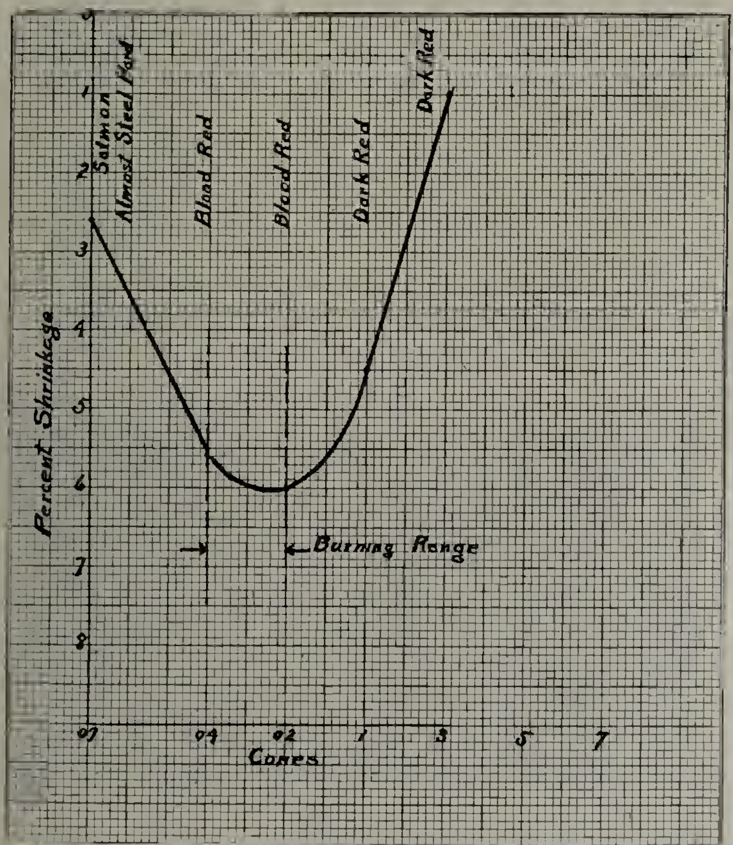
A small amount of finely divided line in a clay has no material effect, but as the lime increases in quantity it begins to get the limey color and short burning range effect noted in heat curves. Still higher quantities may act as a refractory and prevent the mass from fusing, but such very high limey clays will slake and crumble to pieces when exposed. (See No. 9 curve.)

No. 2.



A plastic alluvial clay from Virginia. The dotted curve is a shale from Alabama. The Virginia clay is very sandy, which accounts for the low shrinkage and porosity. The Alabama clay is peculiar in that the shrinkage is advanced 6.6 per cent. at the temperature of cone 07. Note the remarkable hardness range which is undoubtedly increased by several cones below cone 07.

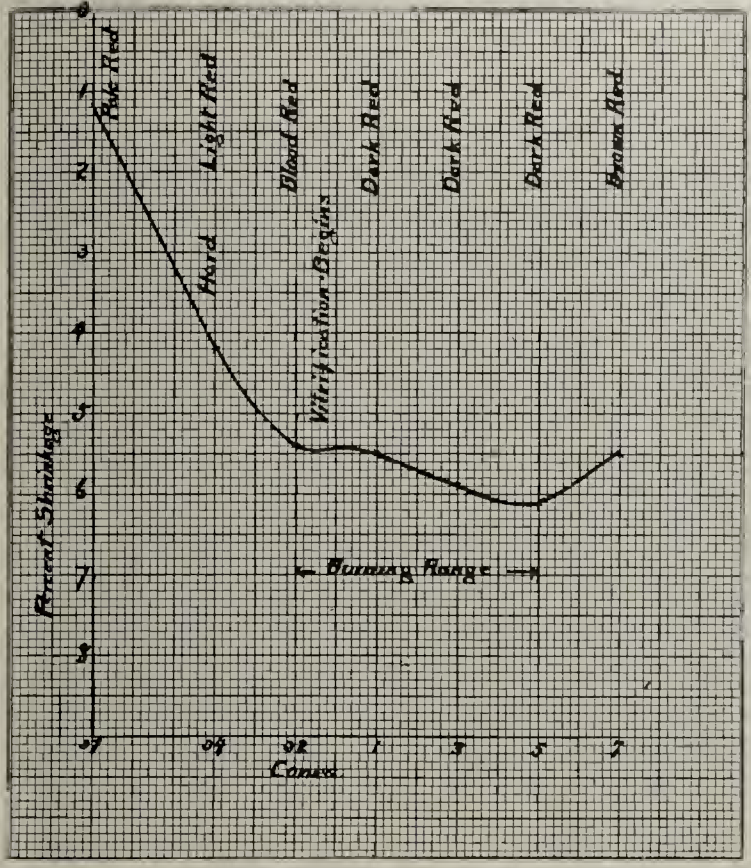
No. 3.



A shale from Illinois. It starts well, following the general direction of the perfect No. 1 curve, except that the rate of change is much more rapid and in consequence the burning range will be greatly reduced. At about cone 02 the test begins to bloat and swell, and this temperature is the limit of safe burning.

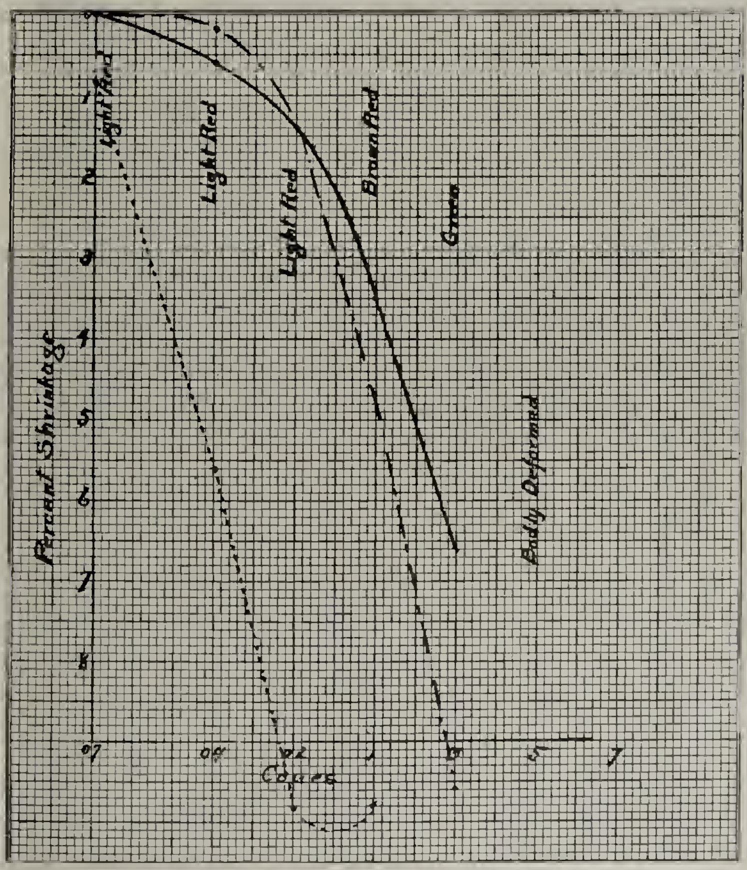
Gypsum (sulphate of lime) is frequently found in clays. It is the mineral which causes scumming, and any clay ware suitable for face building material should be tested for this trouble. Gypsum does not dissociate at low kiln temperatures and consequently may not act as a flux. When it develops as a white coating it goes through the fire unchanged, and the ware is unsightly in consequence. This is particularly true in oxidizing kiln conditions. Under reducing conditions, the sulphate breaks up and the lime content is set free to play the part of lime, and this may occur at a temperature when the ware may have nearly approached the

No. 5.



Is a shale from Maryland. It is perfectly safe.

No. 6.

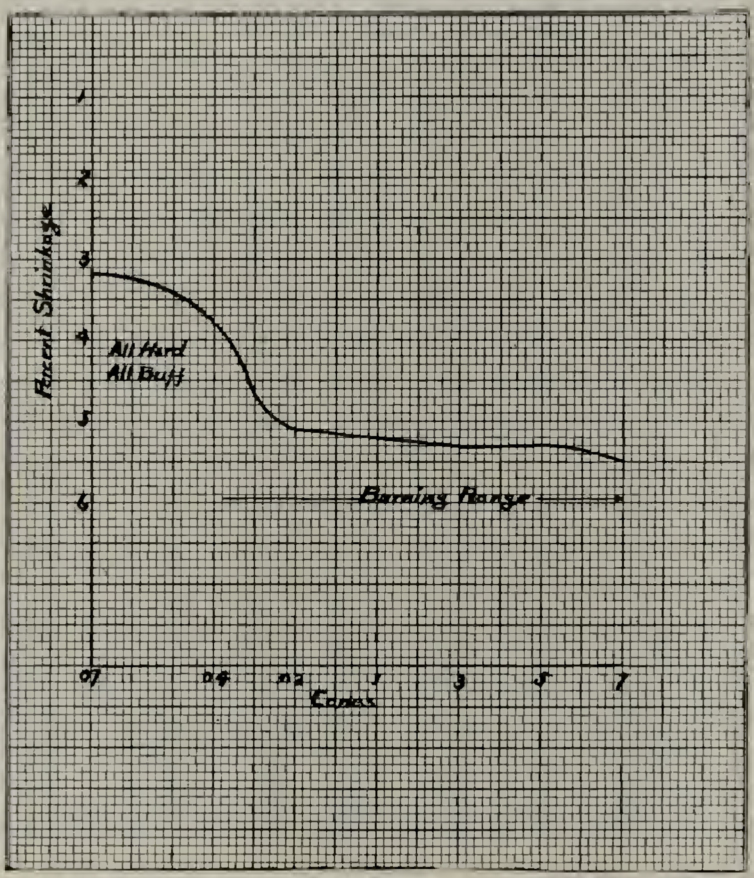


A limey plastic clay from North Dakota. Note the rapid shrinkage toward the end of the burn when the lime gets active. Also, note the failure was complete between cone 3 and cone 5. The absorption was high—from 25 per cent. at cone 07, down to 10 per cent. at cone 3. The dotted curve shows the shrinkage of a similar clay shale from Montana. The dot dash curve shows a limey clay from Michigan which melts to a slag at cone 5. These curves illustrate the sudden action of lime as a flux. These curves show the very limited area in which we can get hard burned ware.

failing point, and this additional flux introduced may be the last straw. When the surface is heavily coated with it, it may increase the density of the surface materially and cause increased shrinkage. If the ware has lamination the result would be to crack the surface and perhaps cause it to curl up and peel off.

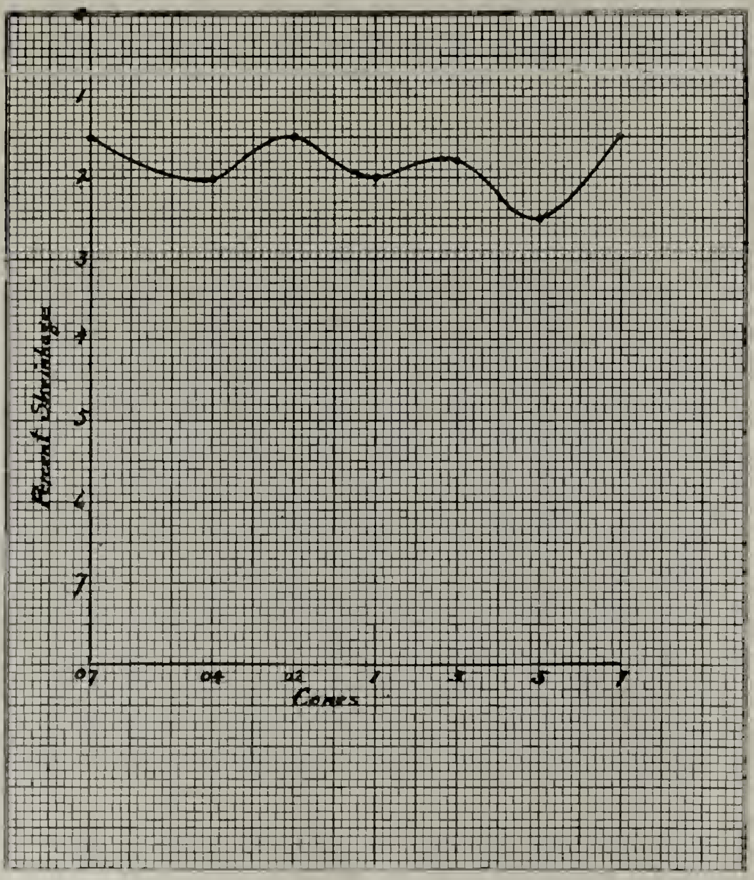
Every clay contains iron in some form and in some degree, but any detailed discussion of iron in clay is far beyond the limits of this paper. Briefly, the iron may be present as a ferric (red) oxide, and it is to this that the red color is due; it may be ferrous oxide, or a carbonate, or a sulphide, or a constituent of some of the silicate minerals. It can be seen at a glance that its effect as a coloring agent will largely depend upon the state in which it occurs in the clay. As a red stain, coating each grain of clay, it would have the maximum coloring power. As mineral grains its coloring power depends upon the disassociation of the mineral at kiln temperatures and upon the fineness and distribution through the clay mass

No. 7.



A Texas clay, even better than No. 5.

No. 8.

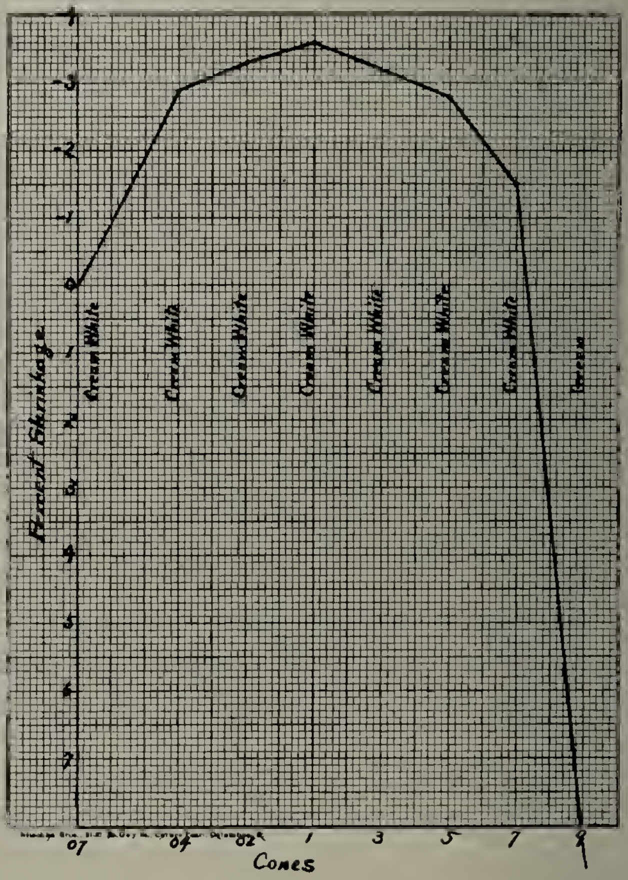


Is a limey Illinois fire clay. The curve shows the contrary tendency of shrinkage, due to viscosity and swelling, due to the effect of lime. When the curve was up the tests were more vesicular and when down less so. It was like a bubbling pot of molasses. Of course, it was worthless.

Usually, when in the form of a mineral other than the ferric oxide, a part or all of it passes into some other mineral form and it is lost as a red coloring agent. For instance, in the form of di sulphide (iron pyrites), when sulphur is driven off, the iron remains as ferrous oxide, in which form it is an active flux and readily takes up silica, lime, etc. If the kiln conditions are oxidizing, some of the ferrous oxide will be oxidized to the red oxide and serve to color the ware red, but a part, and the greater part, will be ferrous oxide which will combine with silica to form a black silicate. Such clays will first develop a red color from the free red oxide present, then become red-brown, the brown due to the effect of the black silicate, hence good color range may be very short and varying. As a red stain on the grains of clay, and without any appreciable amount of other iron minerals the red color may continue even until the ware is burned to glassiness. Iron carbonates will behave the same as the sulphides so far as color effect is concerned.

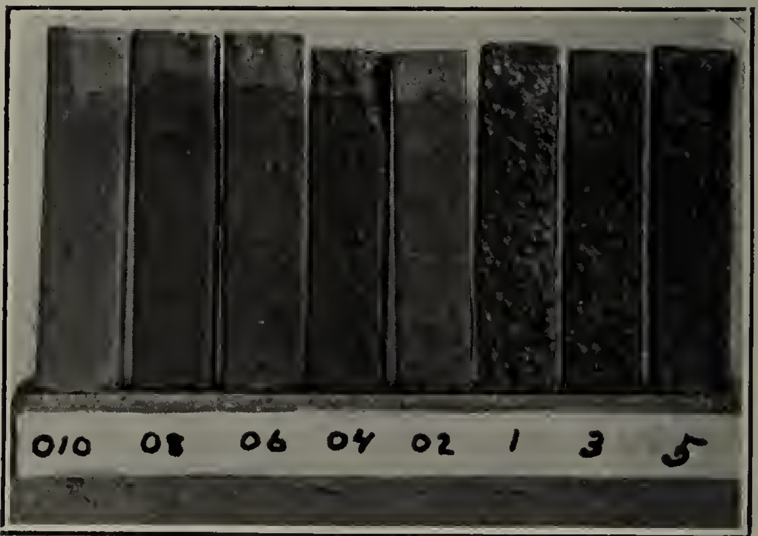
This again shows how futile chemical analyses are in determining the value of common clays, and also how important it is to determine the burning range which at the same time determines the color range. We may have beautiful ware at a certain temperature and there might be a safe burning range, but the color range may be very unsatisfactory.

No. 9



A very limey clay from Quebec, Canada. Tests slaked to powder in a few hours, except cone 9 tests, which slaked after several days. The behavior of this clay is due to a content of lime greater than could be taken into fusion at kiln temperature.

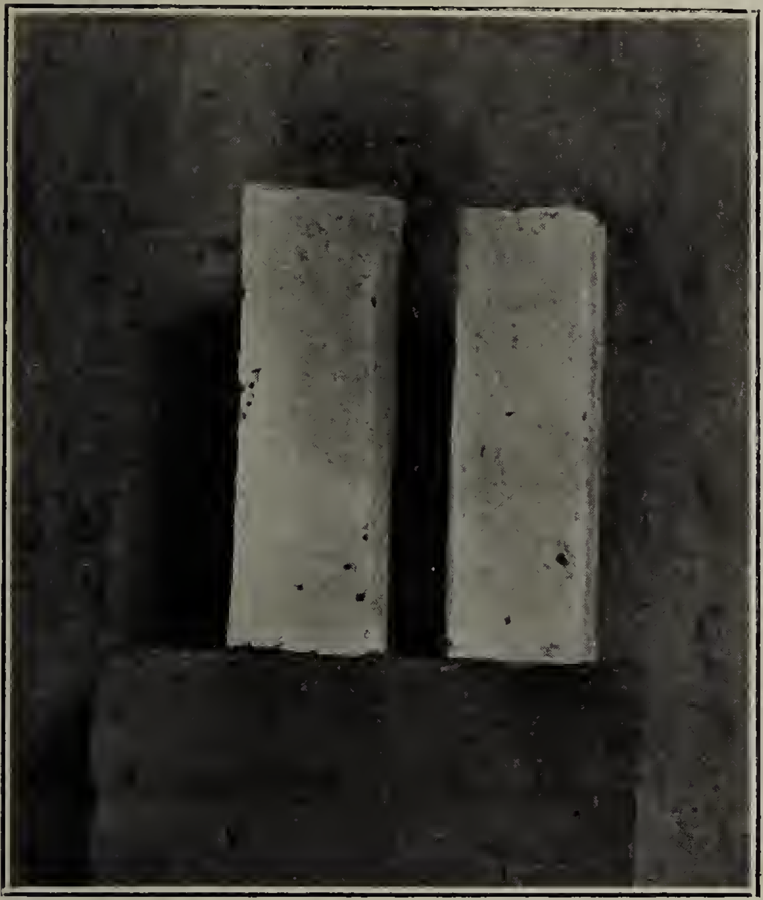
Iron sulphide is frequently the cause of "popping." The little spot in the center of the "pop" will be red or black and will appear at a low red heat below cone 010 if due to iron minerals.



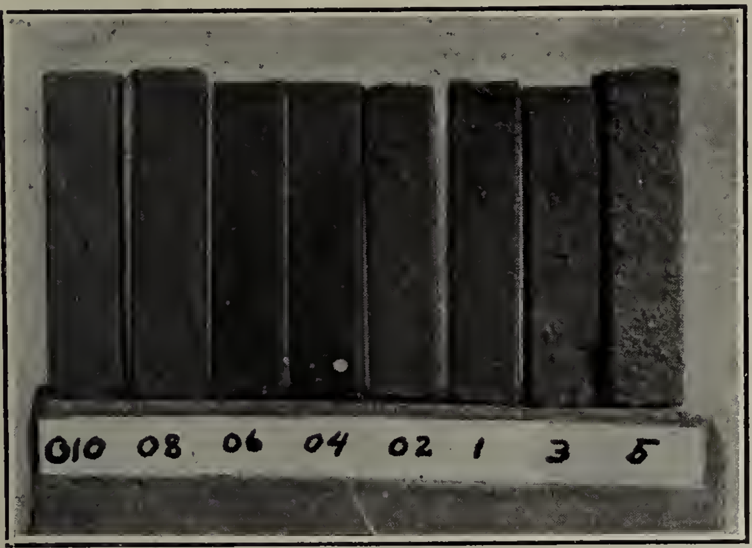
Preliminary test bars, showing pimpling due to concretionary iron not in the form of pyrites.

The danger from iron pyrites is dependent upon the quantity and state of aggregation. Thus, 5 per cent. of 20 to 40-mesh pyrites would not be noticeable in ordinary stiff mud products, while 5 per cent of 16 to 20-mesh pyrites would cause some popping and where a grain happened to lie near the surface, a small fragment would fly off, destroying surface effect. If the quantity is large, as sometimes happens, the volume change of the pyrites may be great enough to burst the brick.

Iron, when in the form of pyrites, gives its greatest trouble in burning. The sulphur begins to come off at a low temperature, but it does not come off completely at any temperature, although the greater part of it can be roasted out before the clay becomes vitrified. Any sulphur given off after the mass becomes vitrified will cause blebs in the mass—bloated ware, familiar to nearly every clayworker. The swelling of ware in continuous kilns, which nearly every operator of a continuous kiln has experienced, is probably a sulphur trouble due to the sulphur gases of the kiln and not to the sulphur in the clay.



A washed fire clay to which has been added 5 per cent. of 16-20 mesh pyrites.

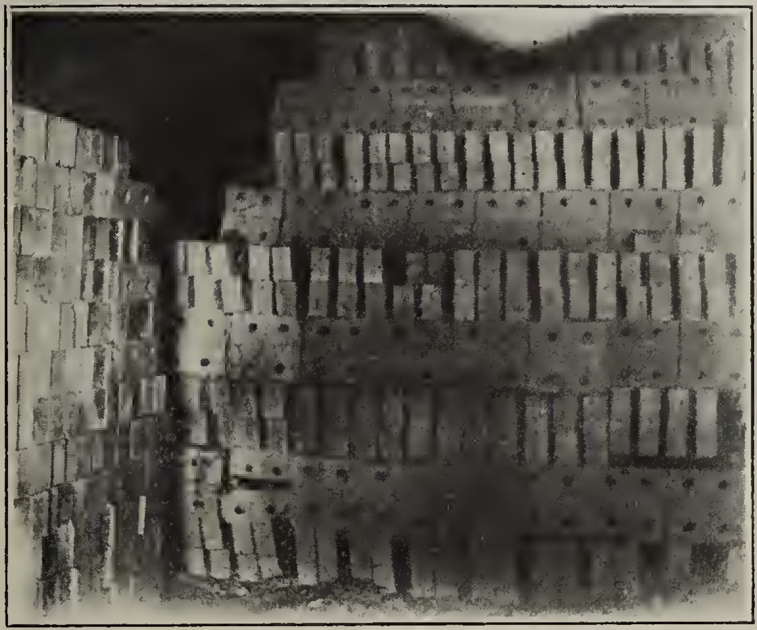


Preliminary test bars, showing the effect of nodulae pyrites. Note occurrence at cone 010.

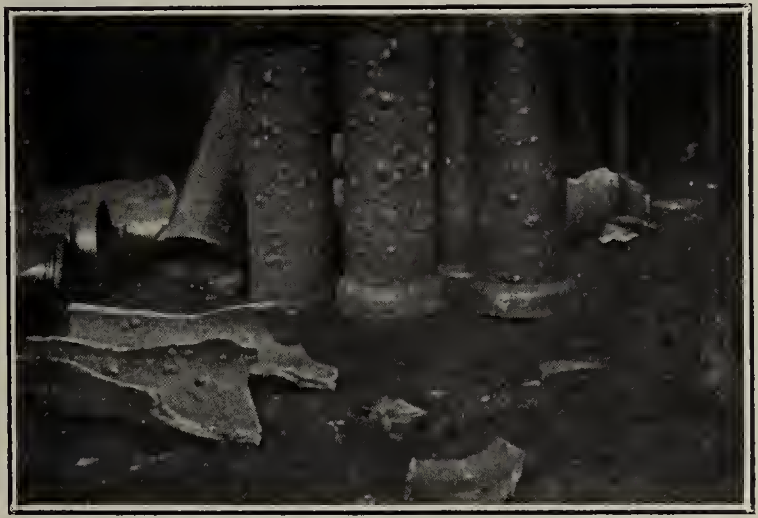
Magnesia is always present, usually in small amounts and gives no trouble. It may be in the form of a carbonate (dolomite and magnesite) or as a constituent of some silicate. Small amounts of magnesia are said to be beneficial as a flux, in that they produce toughness. In large amounts, we have found the material to have a short burning range similar to the behavior of lime. Magnesia, potash and soda in the form of sulphates cause efflorescence—the white scum which comes out on the wall after the brick are laid; indeed, it often appears on the ware in the piles on the yard.

Carbon gives lots of trouble and if the clay is dark colored, the burning should be watched closely and a proper test should cover this feature. The effect of carbon in clays has been fully investigated by Professor Orton and the results presented to this Association. Carbon is a reducing agent, i. e., it takes oxygen from other minerals. Until the carbon is burned out oxidation of other minerals cannot take place and in their reduced condition they may be active fluxes. On the one hand, we have fluxes producing a vitrous impermeable body, and on the other hand, we have carbon and sulphur gases unable to escape as they develop, and instead, fill the mass with blebs which become larger and larger as the temperature advances.

Laboratories properly equipped have machines for the several processes which duplicate commercial conditions and are especially adapted to develop the difficulties in the clay. The laboratory machines are necessarily small and the results are largely dependent upon the experience of the operator and his knowledge of commercial operations. The tests, to be of value, must be practical, and a laboratory equipped with machinery for practical operations would require machines of all types and would be a greater institution than any factory, which is out of the question.



Bursting of brick in the kiln, due to the volume change in iron pyrites during heat treatment.



Pimplings of sewer pipe, due to iron pyrites

The point is this: Materials are sent in with the request that samples of sewer pipe, brick, stiff mud and dry pressed tile, hollow ware, etc., be submitted with the report. This is clearly beyond the province of a laboratory test. The laboratory test digs into the behavior of the clay in every stage of the manufacture and the tests are extreme in order to search out every weakness in the clay. All the products of the machines are subjected to subsequent tests which endeavor to destroy the product in order to determine the limits of the clay in every step of the manufacture.

Presentable ware is not practical in a laboratory test except the test be repeated under conditions in each stage which the real test has shown to be best. This subsequent work belongs to the manufacturer of equipment. The manufacturers of machinery are interested in the sale of such machinery and are prepared to make tests of clays in their machinery which will show how good a quality of ware can be produced. More should not be expected of them, and herein lies the cause of many failures. One cannot expect a manufacturer of equipment to go outside of his field to search out the faults of clay. He tests the clay honestly and sends back the results of the test, and is expected and expects, to give guarantees in regard to the working behavior. It is not his fault if the clay has had bad drying qualities, short burning range, scumming or efflorescence difficulties, bad color or lack of color range. Neither his machinery nor his test is at fault if the clay contains iron pyrites or concretionary iron or lime, if it develops cooling cracks or is seriously handicapped by porosity or lack of hardness range.

The manufacturer knows what his equipment will do with the material and there his responsibility should end. If failure follows, the fault largely lies with the owner of the material or the promoter of the project. The work of an occulist and optician are a parellel; the one tests your eyes, the other fits your glasses to them. If the eyes are normal, if they are not defective other than mere focal adjustment, the optician's work is satisfactory, otherwise not. In clayworking the time to settle such questions is before the plant is built, not afterward.

Combination dry and wet pan and brick machine.

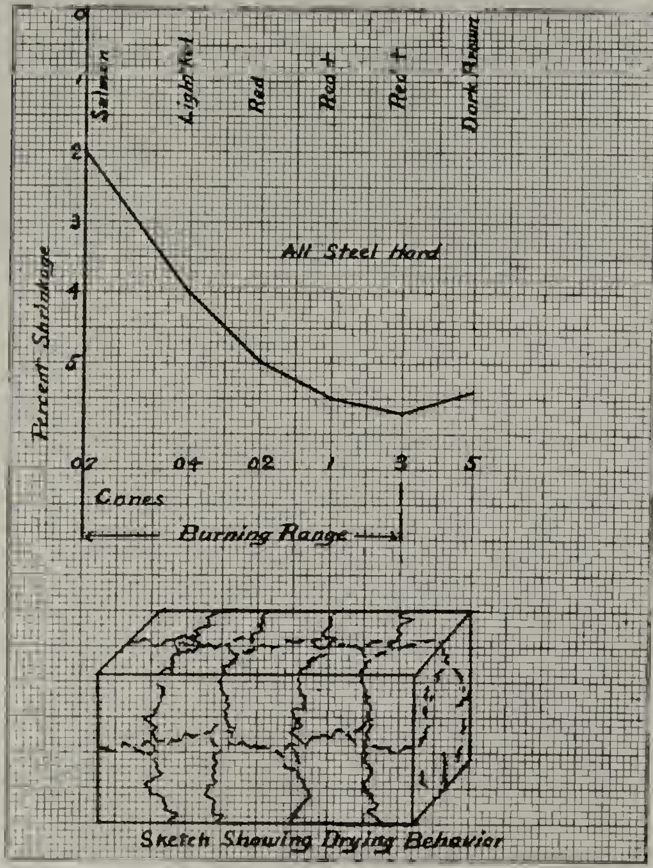
A recent test is illustrative. The material required an excessive amount of water to pug and it changed quickly from a mealy mass to one too soft to work. Unless tempered just right, there is danger of breaking the machine on one hand, or, on the other hand, were too soft to handle. This fact, small as it seems, should be brought out and the factory equipped for a more uniform degree of pugging than is generally provided. Thousands of dollars may be lost in factory operations before this fault is determined and corrected, and, incidentally, I may say the lobby program of the N. B. M. A. is a great arbiter of such faults.

In the laboratory tests it is often necessary to supplement the tests by chemical or mineralogical research. These are of little value alone, but are often of great value in determining the cause of failure.

Nearly every clayworker appreciates the troubles and loss in drying. One may build a dryer and if it fails, build another, and another, if his money holds out, until he has found a satisfactory one or proven that the clay cannot be profitably dried. Many have done this. We have seen clays possessing all the desirable machine

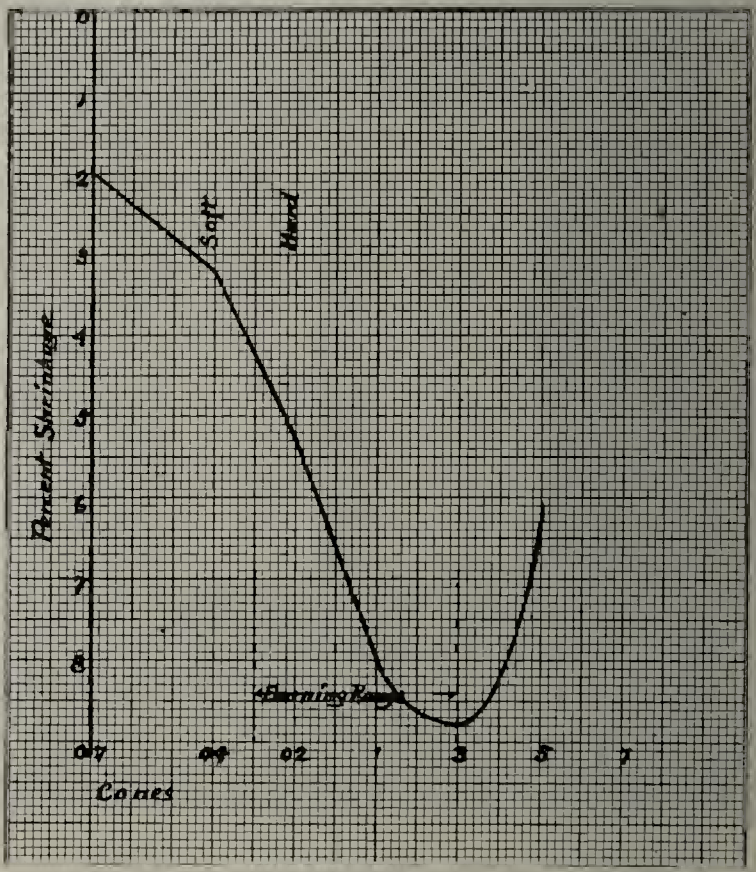
Heat Treatment Curves of Bad Drying Clays.

No. 10.



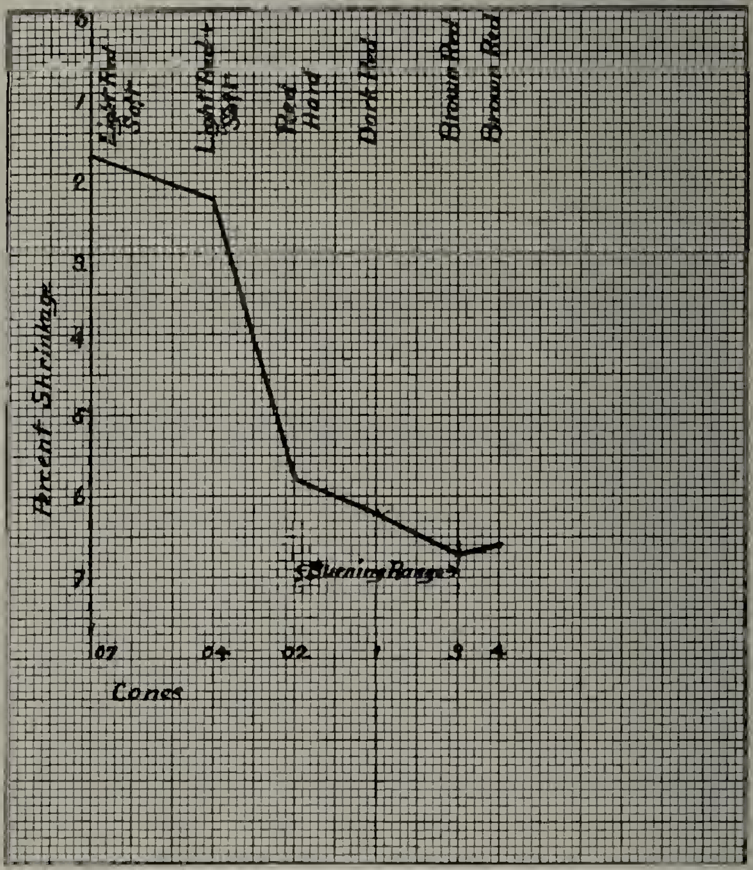
A yellow alluvial clay from Texas which cracked in all drying tests. It has a slight cracking along lamination planes, but in drying it cracks chiefly in squares. The average drying shrinkage is 6.7 per cent.

No. 11.



A South American clay that cracked in squares and just as badly as No. 10. It has a drying shrinkage of 8.5 per cent.

No. 12.



A fine grained alluvial clay from Ilinois. It failed in all dryers, even the easily dried drain tile shape. After one week at room temperature covered to retard air circulation, when about half dry, it was badly cracked. The average drying shrinkage was 5.5 per cent.

qualities with none of the defects, yet they would persistently crack under all degrees of drying treatment that might be commercially practicable. The burning range was sufficient and the color good, but the clay was worthless because the market would not warrant the expensive treatment necessary to insure reasonably good ware.

Laboratories cannot be equipped with all types of dryers, but must be equipped to determine the drying qualities of a clay. The dryers here shown have been standardized on sixty-eight Ohio clays of known drying behavior, and confirmed by subsequent tests of materials which have been successfully developed into profitable wares. Ohio probably has more good and fewer bad clays than any state in the Union. Of the sixty-eight known clays tested, only 15 per cent. were first class, namely: That could be safely dried in twenty-four hours or less; 51 per cent. were second class, requiring from thirty-six to seventy-two hours to dry safely; 19 per cent. required from seventy-two hours to one week to dry safely, and 15 per cent. required some preliminary treatment to make them practical. These dryers may be operated as sample dryers duplicating commercial dryers, or they may be adapted to special humidity conditions.

Ovens suitable for a laboratory drying test.

Drying and burning shrinkages are obtained by marking the test bars with the instrument here shown. The points are set accurately 100 mm. apart. When the ware is finished and set to dry, it is stamped very lightly, leaving a sharp yet distinct impression. At any stage of the test thereafter the distance between the point marks may be read directly in percentage on a millimeter scale. As a method adapted to all classes of clays we find it superior to anything yet proposed.

Instrument used in marking brick and other test wares for the determination of drying and burning shrinkage.

The burning requires a variety of kilns and must be under the direction of someone who has a knowledge of combustion and the effect of oxidation and reduction of pimpling, black coring, bloating and other burning difficulties. A description of these kilns is out of place here, but suffice it to say laboratory kilns are very inadequate for burning sample ware, but they have been designed and are operated to determine the difficulties in burning clay wares.

Following the burning comes the examination and testing of the ware, hardness and porosity, sometimes a freezing and thawing test is required to determine the value of the product. Color and color range must be considered and this involves getting a series of results at different temperatures. A clay may burn light red, dark red to brown within three cones. Another may be dark red through a range of five or six cones. If we select the dark red of the first to compare with a dark red of the second, it may have the better color, but because of the limited range of good color it is doubtful material for a profitable business.

Ordinarily we carry the burning through a range of fourteen cones, 07 to 7, which includes the average commercial kiln temperatures, not counting pottery or refractories. The greater number of red burning clays fail at or below cone 7. On the other hand, an occasional clay develops a good body below cone 07, as shown in curves No. 2 and No. 7.

Scumming must be looked for and reported and tests must be made for efflorescense. Blistering and popping must be accounted for. Vitrification range is very important for an impervious ware and besides in paving materials the character of vitrification must be considered.

Attempts have been made to develop a satisfactory laboratory test for pavers without success. Only a commercial test, followed by a rattler test, is conclusive. The ordinary preliminary tests, however, show the character and range of vitrification and serve to eliminate any clays which are not worth further testing.

I have limited this paper—already too long—to the tests of common clay products, and, in fact, have not considered some common products, such as sewer pipe and other salt glazed ware. Refractories and pottery materials require special and varied tests, none of which have been mentioned.

In conclusion I wish to say that one cannot expect a clay manufacturer to make tests for a probable competitor, nor is a chunk of clay surreptitiously burned in a clayworkers kiln a satisfactory test of a material, yet there are many wrecks by the wayside which were based on such a test, or one equally as foolish and inadequate.

Our knowledge of clay materials has advanced to the position where, with proper tests, a clayworking enterprise can be undertaken with assurance of success so far as materials are concerned, and there should be no occasion to reorganize and re-equip the factory to obtain results. (Applause.)

President Deckman: The discussion of this very able paper will be lead by Professor A. V. Bleininger, of Pittsburgh, Pa.

Importance of Clay Testing.

Prof. A. V. Bleininger: I think Mr. Henderson has covered his subject in a very comprehensive manner. There is very little left for me to say about it. He has brought out the fact that the testing of clays is obtaining information at the lowest cost. We cannot experiment on a large scale; we cannot take tons and tons of clay through the experimental stage because it is too expensive. Therefore it is exceedingly important that we develop apparatus and methods to find out the qualities of clay at a very low cost and in a comparatively short time. I think the importance of clay testing is not generally recognized as thoroughly as it should be. Sometimes we find conditions on plants which could be overcome by suitable clay tests. The subject of clay testing is not as simple as it appears. The opinion which generally prevails is that the chemical analysis is considered to be the most perfect of all tests. Mr. Henderson has brought out very clearly that such is not the case. Our correspondence brings us daily letters requesting chemical analysis of clays, requests which we do not, and could not, satisfy. The physical properties of clays can never be determined by chemical tests alone. We have not yet developed clay testing as satisfactorily as we would like to have it. For instance, in making clay specimens the use of the small machine is not as satisfactory as it should be for the reason that the machines which are available are not of a desirable kind. Likewise, clay tests must be made in laboratory kilns and furnaces. Clay testing should be conducted by men who understand what is involved in work of this sort. I have seen reports by geological surveys made at a great cost to the state, and in many cases the results were worthless. One cannot take clays and burn them in a little dinky gasoline laboratory furnace and get results. You must have a kiln of sufficient size to give results of value. The operator must be familiar with the manufacture of clay products. A boy out of school cannot make the tests and get results. The man must keep in mind the problems of the manufacturer. He must realize what takes place in the dryer and in the kiln. Certain clays which crack under ordinary drying conditions can be made to work by making certain adjustments of the dryer, and the man making the tests must be familiar with these things. I would like to ask Mr. Henderson what rate of firing he practices in his work. It would seem desirable among the laboratories which do clay testing that certain uniform laboratory practices be established, for if these practices diverge too much, it is likely that the results would not connect up as they should. (Applause.)

Mr. Henderson: It is our custom to raise the temperature quite rapidly until cone .010 is reached. In small laboratory tests, such as I showed in my illustrations, there is no danger in oxidation. If the clay has an indication of carbon or other mineral substance that might give trouble in the burning, then the rate of firing has to be governed accordingly. But after it has reached a place where ware should be produced, if burning common ordinary clays, we advance the heat about one cone per hour. We find that the most useful information we can get for translating the results for any clay is based on the experience from former clay tests. We know what they have done in a laboratory kiln, and of many of them we know what has happened after they were burned in the commercial kilns, how they work, and by connecting the two together we can form the best estimate in judging any material. We judge the new by relating it to the old, and if you follow the same method of procedure each time your results will be comparable.

Wm. B. Wreford, Detroit, Mich.

Will P. Blair: If I properly understand the speaker, I want to say his paper and illustrations are a revelation to me. I have always understood that lamination was due to the impact or lack of impact of the sheets or layers which result from the auger operation. Whatever form the lamination takes subsequently is simply due to the structure effect, or deformation effect, which is superinduced by the friction operation in the die. That is to say, one is not independent of the other at all, but rather, the deformation and subsequent conditions are simply a change in the character of laminations that are due originally to the operations of the auger.

Ellis P. Lovejoy: It is a question. You have bad lamination in sewer pipe presses where there is no auger effect whatever, and that would be the equivalent of the die or the lamination in an auger brick machine.

Mr. Blair: That is a different character of lamination, and is due, as I understand, to the physical handling of the clay in the chambers, which is slightly different from the operation effect of the augers. The lamination is really superinduced by a similar physical operation, but in either case is caused by the packing of one part of the clay upon another part. In the auger they are simply flat sheets, but in the sewer pipe chambers all kinds of shapes drop on the other. In the first place, with so many articles dropping into the chamber, there comes a deformation in the die operation, by which we have the structure in result.

Mr. Lovejoy: Just a difference of opinion, Mr. President.

President Deckman: This discussion might go on all afternoon and we would never reach a conclusion. There is a slight change in the program, and we will now listen to an illustrated paper, "What Is the Matter with the Brick Business?" by William B. Wreford, of Detroit, Mich. (Applause.)

"WHAT'S THE MATTER WITH THE BRICK BUSINESS?"

BY W. B. WREFORD, DETROIT, MICH.

Gentlemen of the Convention:

You have all heard the old familiar cry of "What's the matter with Jones, Brown or Smith?" at gatherings of all kinds. You all know the answer. Inasmuch as there is nothing new under the sun, the same goes for the title of this paper, "What's the Matter with the Brick Business," though many times the answer is given to cheer a good fellow who, in the strict sense of the word, may not be all right.

Poster of the Detroit Brick Manufacturers' and Dealers' Association.

The daddy of all building material is in excellent health, but if you took an able seaman, fireman, engineer or any other human being with a trade and told him that he must set back absolutely and not complain, whether you gave him anything to do or not, he would fret himself into an illness. The same thing can be done with an industry, for industry is life itself. There is an old saying, "you cannot make money without spending it." There never was a truer axiom written. Trade conditions have proven it over and over again.

I do not thing any one man in the country could tell "what's the matter with the brick business." Each of us can tell what has happened to it in the particular locality in which we are working, each of us can point to instances of success here or there, caused by certain circumstances, peculiar to that locality. We go, however, into the realm of theory when we say that the principles applied anywhere will produce the same results.

While a man may talk pleasantly upon theories, he talks convincingly only upon such subjects as he has touched with his hand or seen with his eye. Therefore, I am going to endeavor to deliver a message which I hope will be more convincing than pleasant, and confine myself to organization work.

I once rode on the front seat of a stage-coach with a typical old driver, who amused me for some time killing bees by the snap of his whip. I watched him kill over a dozen in as many tries; finally, I spotted a bee-hive with at least twenty-five bees around it and asked him if he could kill them; his reply was: "Nothing doing, lad, them's organized." The story very clearly illustrates the position of the brick manufacturers in the United States. This is not a new condition nor a new statement, but stands out so clearly as a fact that it bears repetition.

I would like to see every building brick manufacturer, big or little, materially assist toward the making of a national campaign for brick. Ask any paving brick manufacturer if he would like to see the National Paving Brick Manufacturers' Association die.

About six months ago, following out a resolution passed at the last convention of the National Brick Manufacturers' Association, a group of brick manufacturers met at Indianapolis, organized and incorporated the National Building Brick Bureau, elected the following officers: Fritz Salmen, president; W. P. Varney, vice president; Geo. H. Clippers, treasurer, and Theo. A. Randall, secretary-manager.

BUILD

WITH

BRICK

DETROIT

Poster Used on Telegraph Poles.

Notification was sent out to all brick manufacturers, memberships and subscriptions solicited. Up to date something less than $5,000 has been subscribed.

The main idea underlying the formation of the Building Brick Bureau is to make of it a power station and clearing house for the development of local advertising and publicity all through the country.

The bureau has a three-fold task mapped out for itself in this connection and others can be added from time to time. The three primary lines of activity are to encourage advertising on the part of the brick manufacturers, to assist in preparing advertising matter and directing the lines of exploitation work, and to collect and furnish specific data for its members that will be of value in the promotion of brick as a building material against all competitors.

The bureau is organized along proper lines and has no intention of going into a wild campaign of money spending, but proposes, by systematic effort, to place before the building public facts, figures and selling talks to aid the sale of brick. One of the first services of the bureau is the publication of a booklet, entitled "Distinctive Brick Homes," a slide of which I will show a little later. If money enough can be raised, the booklet will be placed in the hands of every architect, builder and contractor in the United States. If you will take the trouble to secure a copy of the booklet, you will see in a moment the advantage such a campaign would have. It takes money to do this, which means that every brick manufacturer should contribute something, a $50 or $100 check would help, though it is not enough to gain the actual results desired.

You all know how thoroughly the cement industry is organized. Annually they expend in their publicity campaign twelve millions of dollars, which, as they say, represents but a fraction of a cent of each dollar's worth of business done. The market value of material has gone steadily upward, yet the market value of cement, as shown in the following table, never reached the market value of brick in any one of the given years:

	Amount Manufactured.	Market Value.
	—Year 1912—	
Brick	11,194,795,000	$91,303,448
Cement	85,925,651 bbls.	69,554,385
Lumber	39,158,414,000 ft.	601,081,645
	—Year 1913—	
Brick	10,892,434,000	$93,849,649
Cement	89,541,348 bbls.	89,550,527
Lumber	38,387,009,000 ft.	589,142,588
	—Year 1914—	
Brick	9,704,874,000	$83,187,045
Cement	87,257,552 bbls.	80,553,203
Lumber	37,887,142,000 ft.	*580,557,629

* Estimated.

Figures supplied by U. S. Geological Survey and U. S. Forestry Service.

Still they have an organized publicity fund of twelve millions of dollars, which does not represent the money spent by the individual firms for advertising purposes. Then take the lumber industry which spends annually $50,000 through its National Lumber Manufacturers Association, and is after more money and unquestionably they will get it. They have the jump on the brick manufacturers, and while $50,000 is not such a big jump when all the brick manufacturers in the United States are considered, it's a lead that must be overcome. The ever present reason that brick men must organize is the fact that brick is sold in communities, especially common brick, whereas the cement and lumber interests have the entire United States for their market. This fact alone makes it especially vital that the brick interests should organize for publicity and advertising purposes. Just stop to think what a wonderful assistance a semi-monthly magazine published by the National Building Brick Bureau would be to you, containing suggestions for advertising and publicity copy. It would not be expensive and if a start were made by all brick manufacturers agreeing on an assessment, for organization purposes, of one-half cent per thousand on all brick manufactured it would stimulate the brick market to a degree almost unbelievable. However, there can be no half way station. No small group of brick manufacturers can make a success of such an undertaking. One and all must realize its importance. It is simply a case of "United we stand, divided we fall."

THIS STRUCTURE IS BUILT WITH

BRICK

MADE IN DETROIT

DETROIT LABOR DELIVERED IT

DETROIT LABOR LAID IT

BE A BOOSTER-BUILD WITH BRICK

THE EVERLASTING MATERIAL

Sign Placed on Buildings in Course of Construction.

You will say that I have already stated what can be done in one community necessarily cannot be done in others, however, there are thousands of things that can be worked out for the brick manufacturer, no matter in what section of the United States he might be in. No effort need be made to tell you how to run your business, but suggestions could be offered that would materially assist the individual manufacturer.

Here, for instance, is a sample of what one of the big cement concerns are doing. The letter, of which I am about to read has been received by every live architect in the United States.

New York, N. Y., January 3, 1916.

My Dear Sir:

Beginning January, 1916, an unusual and, we believe, a significant series of our advertisements will appear in the journals of the architectural profession. They will deal with the merits of reinforced concrete for industrial buildings. And also for the first time they will extend to architects the services of our Reinforced Concrete Engineering Department.

The function of this department is to furnish such data as architects may require for their consideration of reinforced concrete, and to lend such aid as may be desired for preparing designs in which the reinforcement is completely detailed. This service is free.

Simultaneously there will appear a series of advertisements to prospective owners in the standard magazines, directing their attention to the merits of reinforced concrete for industrial buildings. They will not recommend reinforced concrete indiscriminately for buildings not suited to its use. They will emphasize the advantages for certain kinds of industrial buildings. They will tell owners that it is permanent, fireproof, economical, sanitary and that it carries the lowest insurance rates.

The result of this we hope to make the owner see the wisdom of permanent construction, so that he may be the better prepared to receive his architect's recommendations.

The object of this entire campaign is obviously to increase the legitimate use of cement. We naturally want you to use Atlas, but the whole purpose of this letter will be missed, and our project itself not understood, if you are left with the impression that in order to obtain the services of our Engineering Department you must use Atlas. We can well afford to be satisfied with our share of the increased business that should result.

G. M. Krick, Decatur, Ind.

Yours very truly,

THE ATLAS PORTLAND CEMENT CO.,

JOHN R. MORRON, Pres.

Just think at what a little cost could be maintained a brick bureau for the disseminating of ideas to architects concerning brick.

With your indulgence I am going to tell you what has been done through a local organization in Detroit, known as The Detroit Brick Manufacturers and Dealers Association, operating since a year ago last September. Partly as the result of the work of this association it is necesary for every brick plant in Detroit to work full force all winter in order to prepare for the present demand and the rush of the spring building season. There is nothing very difficult about the work of the association. In order to show you what they are doing I have prepared a few slides. Here are some of the lines of endeavor that are being followed:

During the first year we paid for 1,000 inches of newspaper advertising and as the result of this we had 2,000 inches of free publicity published. Let me call your attention to the fact that names of brick manufacturers are not used in any of the copy.

We have what we call a building sign, a card 22x28 inches, which is placed on every brick building under construction. These signs cost $2.80 per hundred.

Then there is our road sign. These signs are placed on all roads leading into Detroit with the arrow pointing toward Detroit. These signs are 14x22 inches and cost $2.00 per hundred.

The wagon sign is used on all wagons that haul brick. They cost $5.00 per hundred.

The poster stamps, of which there are six designs, are used by the various brick manufacturers and dealers in the city on correspondence. They are also used on the boxes of matches distributed. The matches are to be found in all the clubs in the city. They are also distributed to cigar stands in the pricipal buildings in the heart of the city. They cost $1.50 per thousand sets of six.

The 'phone pads are on the 'phones of all architects and contractors in the city. They cost 21 cents each.

The cigarettes are used at banquets and social gatherings of architects, the builders and traders exchange and real estate board. They cost 18 cents a box.

The blotters are distributed monthly through the principal office buildings in the downtown section and the architects, contractors and real estate dealers outside the half-mile circle are reached through the mails. The blotters cost $6.25 per thousand.

The back of the Detroit building code carries the Build with Brick advertisement. The cost is $3.00 per year, 5,000 copies being printed by the publishers.

The Edison fire booklet illustrates and shows the results of fire on buildings built of brick and reinforced concrete. The brick buildings were intact after the fire and the concrete buildings had to be torn down and reconstructed after the fire.

A "Made to Order Fire," is a booklet written about Chicago celebrating fire prevention day by burning two houses, one of brick construction and one of frame construction, comparing the results after the fire.

Our test booklet, known as "Practical Tests," contains facts pertaining to brick and hollow tile construction. These tests were conducted under the supervision of Professor F. N. Menefee, in charge of the Materials Testing Laboratory at the University of Michigan. These tests cost about $3,200, a copy of the booklet has been supplied to all architects, contractors and builders in the city of Detroit.

A rest room was maintained at the Michigan State Fair last fall at a cost of $297.35. This room was made entirely of Detroit-made common brick. It was so popular that it will be made an annual feature.

Space has been retained at the Builders and Traders Exchange permanent exhibit at a monthly cost of $35. An architect is now at work drawing plans for a miniature brick house to build of miniature common brick. The size of this space is 10 feet by 11 feet.

Last, but not least, the booklet supplied by the National Brick Bureau. This booklet contains information relative to the history of the brick making industry, in addition to the twelve designs for brick homes. These designs were selected from among the ones that were submitted to the Indianapolis Star during its recent competition for the best drawings for brick homes to cost not over $7,500. All Detroit architects and contractors have been supplied with a copy.

The photographs shown are views of some of Detroit's largest brick plants.

This gives a general outline of our activities in Detroit, which you see is simple publicity and advertising work that can be successfully handled in any community. In order to show you that the cost is not excessive I am showing you herewith a budget amounting to $10,000.

Office rent	$500.00
Office supplies and maintenance	450.00
Salaries	3,800.00
Newspaper advertising	2,800.00
Booklets	500.00
Mailing costs	175.00
Other printing	300.00
Cuts	100.00
Outdoor advertising	950.00
Outdoor signs	75.00
Papers and magazines	50.00
Miscellaneous	500.00
Total	$10,000.00

Summing up, what answer do we get to "What's the Matter with the Brick Business?" As I see it the answer is, "Be Alive." In Detroit a brick man has just served his year as president of the Builders and Traders Exchange, another is director of the Board of Commerce and President of the Public Lighting Commission, another is a fire commissioner, another is a building commissioner and has recently been elected president of The Michigan State Fair Association, which holds its annual fair at Detroit. Make 'em talk brick and they will buy and use it.

The last word I have to say is on the everlasting question of price. My suggestion along this line is to create a demand and the price will take care of itself. (Applause.)

(Note—Mr. Wreford's paper was illustrated by a number of interesting views, a majority of which have appeared in The Clay-Worker. It will be reproduced as a pamphlet, in which form all the illustrations will be shown.)

President Deckman: The discussion of this most interesting paper will be lead by Mr. A. V. Sturgeon, of Suffolk, Virginia.

A. V. Sturgeon, Suffolk, Va.: Mr. President and fellow members of the association, I will make my remarks on this subject very brief, because I have a feeling that this is only to be the start, and many of you will want to speak later. I want to say there is absolutely nothing the matter with the brick business. We have the oldest business, the most reliable business and the most needed business of any manufacturers in the country. I am sure the trouble, as we have seen from the beginning of the discussions of the convention, has been with the operators and not with the business. The president struck a chord in the beginning yesterday afternoon, the next speaker followed it, and showed that the trouble was within ourselves and not within the business, and that we need the arguments that have been brought to you is evident, and so much has been said, and it is so plain and so pointed that it would be useless for me to undertake to extend that line of argument that has come to my own mind. This is a matter with the operators in the brick business, and it is in our individual relations with each other. One of the speakers yesterday afternoon very aptly pointed out a defect that comes to many of us, and that is the honesty with which we deal with each other. Out in Kansas a man made a deal and sold a lot of brick, and two months afterward another manufacturer comes along and tells the buyer he could have furnished the brick for less money. Now, it is not very likely that he could have done it, but he wanted to make an impression on the buyer and injure his competitor, and as a result it is likely that he injured himself. That is one of the things that is the matter with the brick business. Many of us go along the same way, cutting prices, undermining our competitors. It is the matter with the operators and not the business, so I am sure that these speeches which have been made will start us along in the right way, and when we will go back to our homes from the convention we are going to be very careful with our individual business and with the business of our brother, for what is going to help our brother is going to help us.

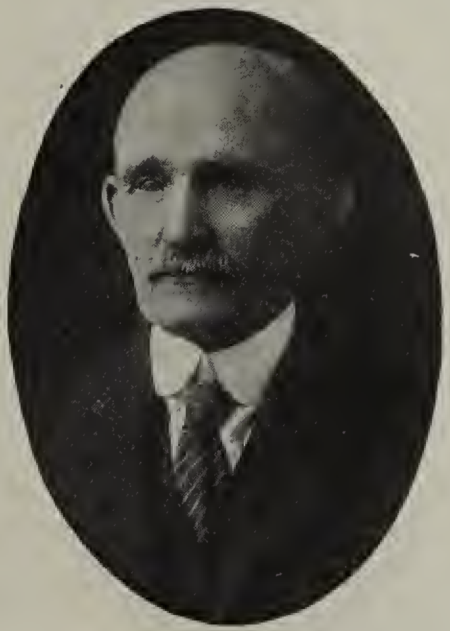
The matter of fire protection is one that is being impressed on the whole country. We, in Virginia, are not so slow. We build a town of thirty thousand in sixty days and burned it up in thirty hours. If it had been built of brick it would not have burned up. These are some of the things that have come to me, and I am going to leave the subject for the convention to take up as they will. (Applause.)

President Deckman: Is there any further discussion on this very interesting subject?

National Building Brick Bureau.

Secretary Randall: I want to say just a word or two on this subject, inasmuch as Mr. Wreford and I have been rather intimately associated and the paper was written at my suggestion. I wanted to demonstrate that you can each do locally what Detroit has done in promoting the brick business, if you will go about it intelligently. We have heard so much talk without results that it appears we ought to do less talking and get down to brass tacks and get busy. In this line of work I believe you must depend to a large extent on local influence and local organization, rather than on national organization. You would be surprised if you could know what little consideration brick manufacturers, with thousands and thousands of dollars invested in their business, give to a proposition put up to them that really is intended to boost their own business. In the last eight months that I have been trying to interest the trade in the B. B. B., I have visited several cities and met quite a number of groups of brick manufacturers, and I have yet to talk to a single group that those present have not said heartily and emphatically, "You are on the right track," "This is a fine work," "It ought to be done." And yet how many of these men are ready to get back of the bureau with actual support—how many of them will subscribe 2 cents a thousand for every thousand brick they make? This is the point I want to leave in your minds; it is not to be accomplished by talk. It does no good to compliment Randall or Wreford or slap us on the back and tell us we are good fellows; you have to do more than that if we are to get results. You have got to take it home with you and prepare to spend some money if you get anything out of this work. As Mr. Wreford said, and as everybody knows, "you have got to spend money to make money." You have got to act on that line in your own localities. The bureau contributors and directors want to have a meeting this evening following adjournment, and we will then consider what we have done and what we can do. It would be a crying shame if such work as this bureau contemplates should be allowed to drag for lack of enthusiastic support by the brickmakers of this country.

I went before a certain clay club, where there had been some missionary work done ahead of me. I spent a day with them by request, and every single man said, "Yes, sir, we ought to get behind that movement. It will help us." After we had talked two hours, I said, "I am glad you are all favorable to the bureau. Now, how much will you contribute for the coming year? We have got to get started, and you cannot see results perhaps for a few months or a few years, but if you get behind it right the results will come. How much money will this bunch of men contribute to the bureau?" They began to fidget and they began to hedge and they said "Business is so rotten," and "We have just been getting up some printed matter." I expect they had spent as much as $25 on printed matter. (Laughter.) And that was a city of nearly a million people, and only one member of that bunch really wanted to contribute actual money. He said finally, "We evidently can't reach a definite conclusion today. I will try and get a favorable conclusion within a few weeks." Now, I have never heard a word from them since. They are still considering. They all agreed that the bureau project was a good thing and said it deserved success, but when I asked them for a little money it was "Katie, bar the door."


A. V. Sturgeon, Suffolk, Va.

The old saying that talk is cheap certainly fits this case. Mr. Wreford has made a great success in Detroit. He don't know how to make brick, but he knows how to advertise. There is not a man in this room that cannot get from the trade magazines every month matter for good advertisements such as Mr. Wreford showed you on the screen. Mr. Wreford has made the most of his opportunities. His match-box idea was a good one, and he has made good use of it. The trouble with brick men is they do not use the ammunition and the ideas that are put before them. You do not realize what you can do; what Mr. Wreford has done, every man in this room can do if he will but try. I would like to put Will Blair on the witness stand for a few minutes, as an object lesson, not as a horrible example. Mr. Blair started the work of the National Paving Brick Manufacturers' Association a good many years ago. Today you recognize it as a powerful influence in the industry, but you do not take into account the long, hard, barren years at the beginning of his work. What is the age of the N. P. B. M. A., Mr. Blair?

Mr. Blair: About eleven years.

Mr. Randall: During the last half-dozen years the association has been recognized as a powerful influence for good in the paving brick industry and has been liberally supported because of that fact, but for the first half-dozen years it was mighty uphill work, and there were doubting Thomases not a few whom it was hard to interest because they could not see immediate results. If we can secure sufficient support for the National Building Brick Bureau, it, too, will prove a powerful influence for good, but it cannot be done quickly. It takes time and work to develop such an organization.

W. D. Gates, Chicago, Ill.: Mr. President, it cannot be done. I made up my mind I was getting old and careless, and I would keep my eyes open and my mouth shut, but it can't be done. From the very beginning of this association one of the rules was that prices must be shut out, and this association was to devote its energies to improving the quality of brick, and prices have always been tabooed, and it has been one of the good things of coming to these conventions that, no matter how much it bothered us the rest of the year, that one week it was a matter to be kept secret. It was the one phase of manufacture of which the manufacturers were ashamed, and when I came to the convention I found there were others. The question of prices has been something holy, and it has always been a mystery to me. I belong to an association of terra cotta manufacturers, which, it would seem, is composed of the most foolish people on earth, but I get recreation in coming here. (Laughter.) We thought we were in the worst line of business possible, the lowest priced business and business in which there was an overproduction, but at last we got together and said, "Here, we will contribute one-half of 1 per cent. of our sales for publicity." We hired a secretary at a pretty good salary and we spent about twenty-five to thirty thousand dollars in getting out a book to show how to use our material, and we have been aboundantly satisfied with our expenditure. I think there is only one way you men can do, and that is to pay a certain per cent. on the amount of brick you make. I talked it in our conventions until I got to be a bore. I think it should be distributed in just that manner, and two or three cents a thousand on the brick sold, or possibly it ought to be a little more the country over, and everybody would get the benefit. It is what the cement men and others have been doing, and you will find that it will produce the results. Years ago we men went down to Washington and spent some money, each fellow paying his own expenses, and we advocated so many cents a thousand on the brick made, and some of them said no, that would not do. They said send out a letter asking for contributions, but it did not pay. Each man has got to do his part, and if he will pay so much a thousand for the brick sold, you will find you can make this thing go.

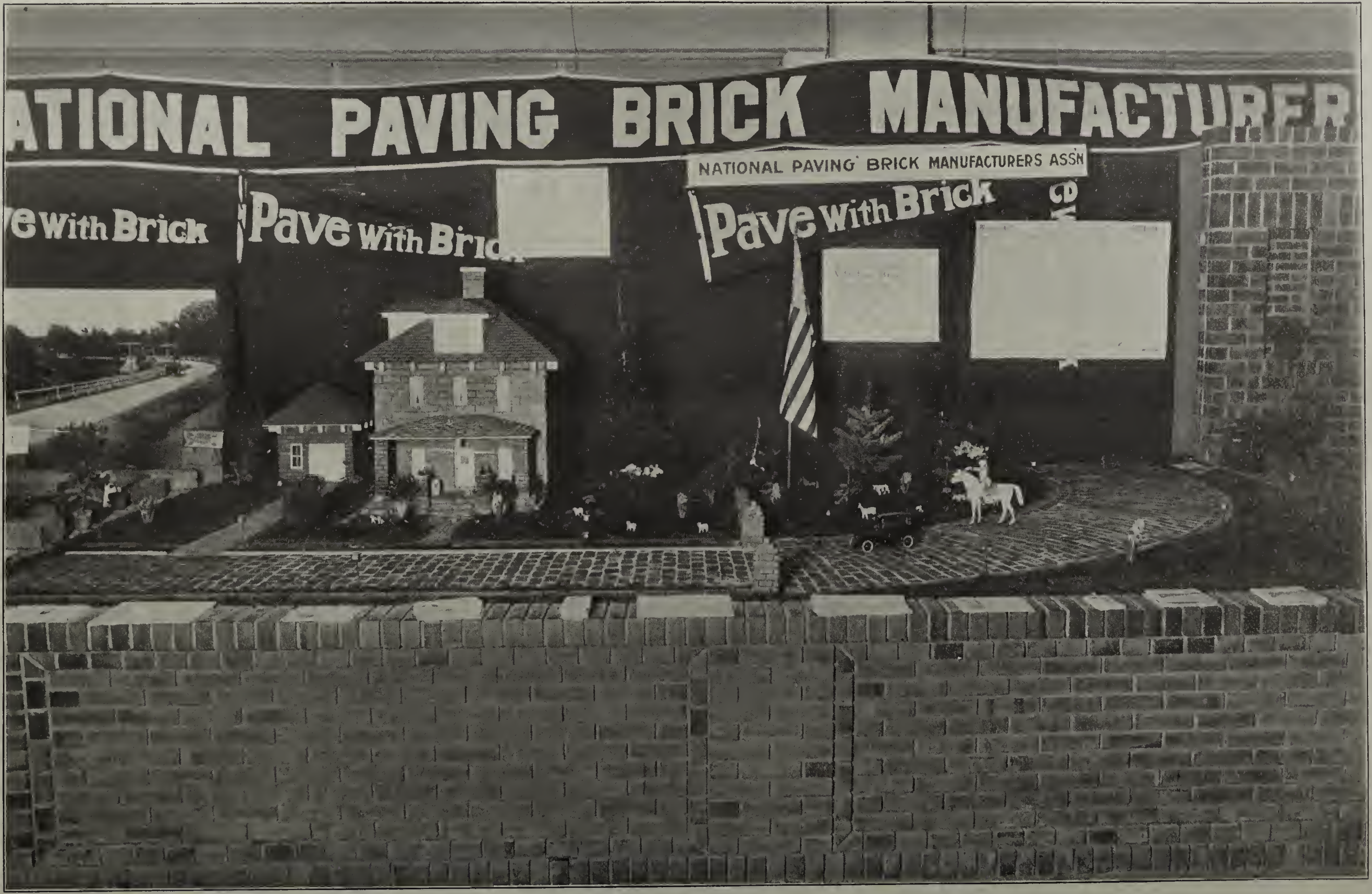
W. J. Snyder, Brazil, Ind.

Harold Penfield, Bucyrus, Ohio: I wanted to add a word to what we have been considering on "What Is the Matter with the Brick Business?" Going around the country, as a machinery man does, he has a chance of meeting a good many of the manufacturers and knowing the conditions existing. I think Mr. Randall will bear out my statement, that the men who have followed this campaign, who have contributed to the campaign, have been men who ship out of their own locality, men who have advertised in other markets. The man who does not ship outside of his own locality will not see the effect of this, but the man who has to ship outside will appreciate the effect of the advertising Mr. Randall is trying to do. We are in our own way trying to provide ammunition and give every assistance we can in the way of distributing advertising matter for the brick trade, and our advertising manager will give you any assistance in this line that you may desire. We hope this matter will be taken up in earnest, and we will give our share to its support. (Applause.)

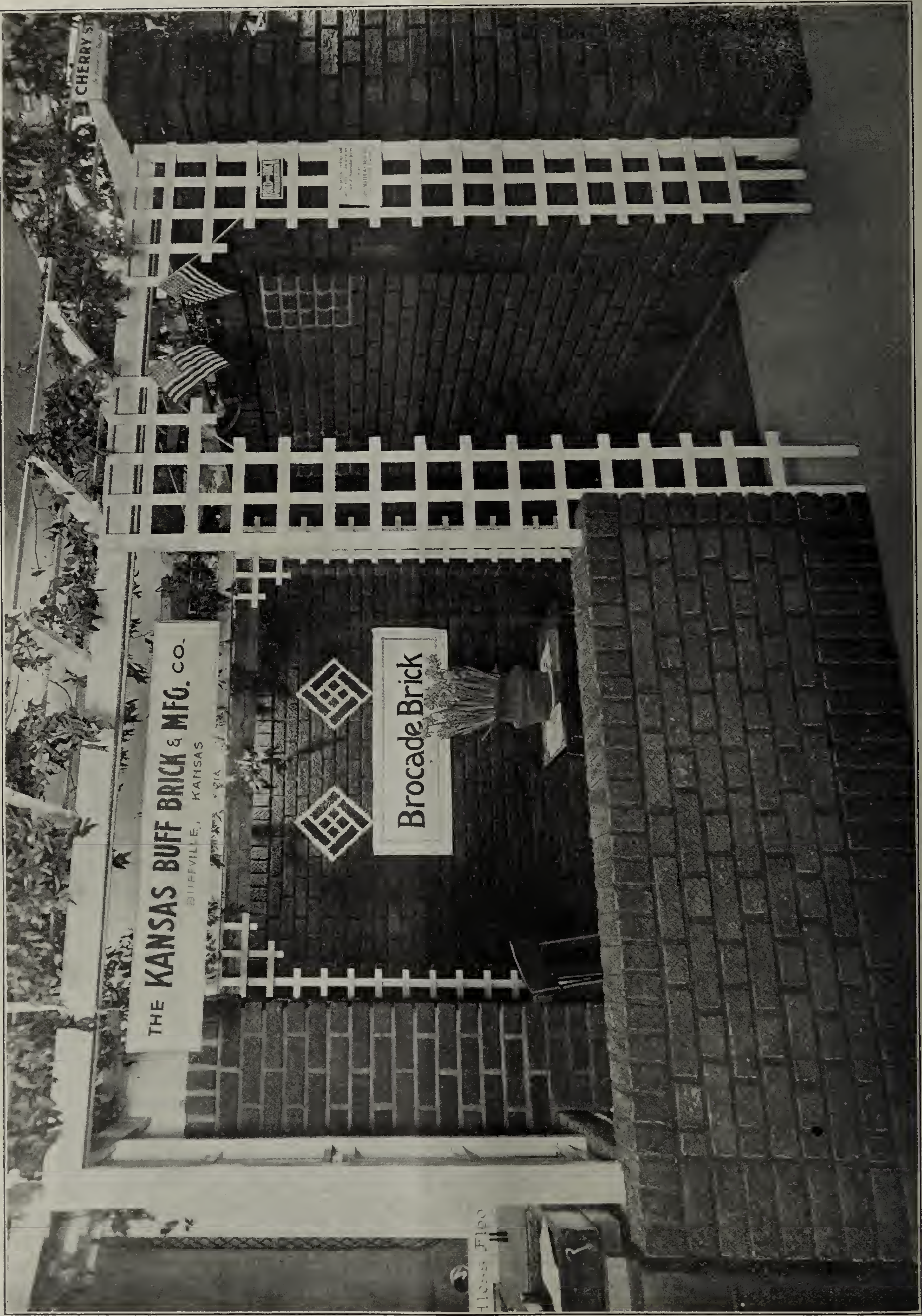
W. P. Blair: I am only going to say a word or two in this connection. There is only one way this can be done—you have already had it said to you substantially by Mr. Gates. If each one of you is selling in your locality for $6.75 a thousand, for instance, will charge $6.78 a thousand and give the other 3 cents to your building brick bureau, you will have the question solved all over the United States, and not one of you will lose a sale because of the extra 3 cents, and you will put this thing through, and put it through darn quick.

Secretary Randall: Really, the bureau directors have it in mind to suggest to brick manufacturers throughout the country that the price of brick be advanced 25 cents a thousand, 24 cents to be spent for local publicity and 1 cent a thousand be paid into the building brick bureau for general publicity. Three cents a thousand will get you started, but cannot the brick men of this country see that they can put a price on their material that will enable them to devote a part of it to the publicity fund? Every merchant adds the cost of his advertising to everything he sells. It is perfectly legitimate and perfectly proper. The government officials who have been hounding business for years are realizing that manufacturers have a perfect right to add the cost of making and selling to the market price of their material.

Mr. Mayer: I was elected president of the Pittsburgh Clay Club, and I want to tell you what occurred at Pittsburgh. The Pittsburgh brick manufacturers had been in a throat-cutting, price-cutting war for so many years that they were so cross with each other that you could not hold them in the same room. When one went in, another went out. They positively refused to stay in the same room with each other, but finally we decided we would try to get together and arrange for one meeting a month, at which time we had a miniature banquet and everything was discussed but price. But we stated to each and every one who came in, "Don't say anything about price, because, according to the Sherman anti-trust law, you must not conspire to raise prices on the poor public." Now, of course, we did not do that, because we took into consideration that the poor public must be cared for. But as a result of those meetings we finally succeeded in making the brick of uniform size. The trouble in Pittsburgh was that one fellow made one kind and size of brick and another made another kind and size. The result was that the man with the biggest brick got the contract, and he would say to the buyer, you can get two feet more of wall out of my brick per thousand than you can of the other fellow's, and he would get the contract. Consequently, the other fellow was not idle, and he cut prices, and this went on until you could not get a decent price any longer. The price at the plant was $4.25 to $5.00. We went along and standardized these bricks, and today you can buy brick from any factory and they all size up together. So we took away that argument. But still we did not say anything about the price. If anyone mentioned price, we would say, "Hush! hush! you must not say anything about price!" I sat down one day and I wrote this kind of a letter. I got the personal address of the manager and all the active fellows in the various concerns.: "Dear John—I want to inform you that I have been inoculated with a peculiar disease, and when the doctor was called in and diagnosed the case, he announced that it was a better price fever, and he prescribed a better price for brick, and hereafter, on and after March 1, 1913, we


ATIONAL PAVING BRICK MANUFACTURER
NATIONAL PAVING BRICK MANUFACTURERS ASS'N
Pave With Brick
Pave With Brick
Pave With Brick

UNUSUAL AND ELABORATE EXHIBIT OF THE N. P. B. M. A. AT THE COMPLETE HOME SHOW, CLEVELAND, 1916.



A FINE EXHIBIT OF ROUGH TEXTURE BRICK AT THE COMPLETE BUILDING SHOW. CLEVELAND, 1916.

amount to the building brick bureau and let the business begin.

Mr. Sibley: I accept the amendment, and I am sure Mr. Gregory, who seconded my motion, will also agree.

President Deckman: The amendment having been accepted, now becomes a part of the original motion.

Secretary Randall: How many men in this room are manufacturing common building brick? (Quite a number held up their hands.) How many will respond favorably to such an application? (Nearly all who had held up their hands to the first question lifted them again.) Now we are getting somewhere.

B. H. Richards, Edwardsville, Ill.: I held up my hand on that proposition, but it has just occurred to me that if this thing was handled something like they handle a Y. M. C. A. campaign for a building fund, that is, the bureau decide on a certain amount that they want—$10,000, or $50,000, or $100,000—then they can make a request to each manufacturer to send in his donation and let that donation be conditional upon their getting a certain amount. Lots of times we feel like donating, and yet we feel that the other fellow is not making a donation, and so we are apt to stick it in the waste-basket. So if each manufacturer knew that his donation was conditional on getting a certain sum, every man would donate freely.

J. Fred Smith, Omaha: I believe we want to work each location. Each man here from different locations ought to go to work with their own proposition and work it out and see that it comes into the bureau and not have any tails to it. It never pays to tie a tail to anything.

Mr. Blair: Don't tie any tails to this thing here. The very minute you put in that sort of a condition it loses its effect. Tie your faith to it and send in your contribution.

Mr. Richards: That just occurred to me because that has been done. The Building Brick Association of America, which originated some six or seven years ago in New York City, solicited donations and we contributed one or two years, and then we found the other fellows had stopped contributing and we found we were one of the very few who were contributing, so we quit sending in our check.

Mr. Sibley: Just as a matter of information: I was in the Building Brick Association and was a director. I think it served a fine purpose and accomplished a great deal while it was in existence, but the great trouble was, it was a mixture of face brick and common brick, and the face brick fellows insisted that the two be divorced entirely. As Mr. Lee said, we could not have proper affiliation. This bureau is distinctly for common brick, and if you will have enough persistence, I am sure you will win out.

Mr. Smith: The folks who give the most to the bureau should get the most publicity.

Lawrence Koblitz, Cleveland: I want to say for Cleveland, will charge at our factory $6 for brick." On this paper on which I wrote this letter I put a little cinnamon oil, so that when they took the letter out of the envelope the odor would permeate the room, and I said further, "You may notice a peculiar odor about this letter. It is the serum that inoculates the better price disease." Consequently, on March 1, we got a price of $6 for our brick. Since that time we have been inoculated twice more, and the price in Pittsburgh today is $7 a thousand. We have not gotten them to support the National Publicity Bureau as they should. They agreed to contribute $1,000, and they have paid, I think, $275, and there is the same amount in the treasury to be paid to the bureau, and we will come through all right. This is the only way to get men together who have been cutting each others' throats for a long time. A man who will sell all the brick he can supply to his own neighborhood and then ship what brick he has left over into a neighbor brickmaker's field commits as great a crime as a man can be guilty of. What good does it do a man to cut the price of brick? What good does it do to cut the price of anything? It may prevent your competitor from having the luxuries of life he ought to have; it may keep him from riding in an automobile; his wife may have to wear her last summer's hat, or his daughters may not be able to go to college or school of the education they ought to have. It is a common saying that a man's eyes are the windows to his soul. You ought to get together, take your wives along, associate with one another, look into the other fellow's eyes and drink from his soul good fellowship, and if he hasn't got it there, see that he gets it. You are going to succeed in this bureau proposition, too, for I now believe you are started on the right track. You needn't be afraid of the Sherman anti-trust law any more. It is a back number.

John W. Sibley: I am pretty sure, after hearing this most instructive and entertaining paper and the discussion that has followed it, there is not a man in this room who does not concur in the doctrine which has been so successfully promulgated in Detroit, but the trouble is that it is not reaching the folks we want to reach. I am supposed to be the watchdog of the treasury, and always provide a surplus in my annual report, but I am going to make a motion that this paper of Mr. Wreford's and the very interesting and instructive discussion which has followed it be published in pamphlet form by the association and that it be mailed out through the brick bureau to all the common building brick manufacturers we want to reach. There is no telling where the seed sown will bring forth some fruit, and bring forth a harvest such as has been brought forth in the paving brick manufacturers and the terra cotta people and the face brick manufacturers. It is a much harder and more difficult task to attempt to convince the common brick manufacturers of this country that it is just as necessary for their own salvation and betterment, but if we will have the final perseverance of the saints, we will get them, and that reminds me of a story, a story I heard on one occasion of a man being solicited for a Y. M. C. A. fund. He was a pretty stingy old fellow, and one of the fellows who went in to get his contribution said it reminded him of a story of another fellow, a pretty rich old man, who had a reputation of being tight-fisted, but he had to have a tooth removed, and the dentist told him it would be necessary to give him gas. Just as he was getting into the chair the dentist noticed that he had a piece of white paper in his hand, and he said, "My friend, what is that you have in your hand?" and he said, "That is a check for your fee, and when you get me under the influence of the anesthetic take it away from me, because that will be the easiest way of getting your fee." (Laughter.)

Robert Mitchel, Cleveland, Ohio.

Mr. Gregory: I second Mr. Sibley's motion.

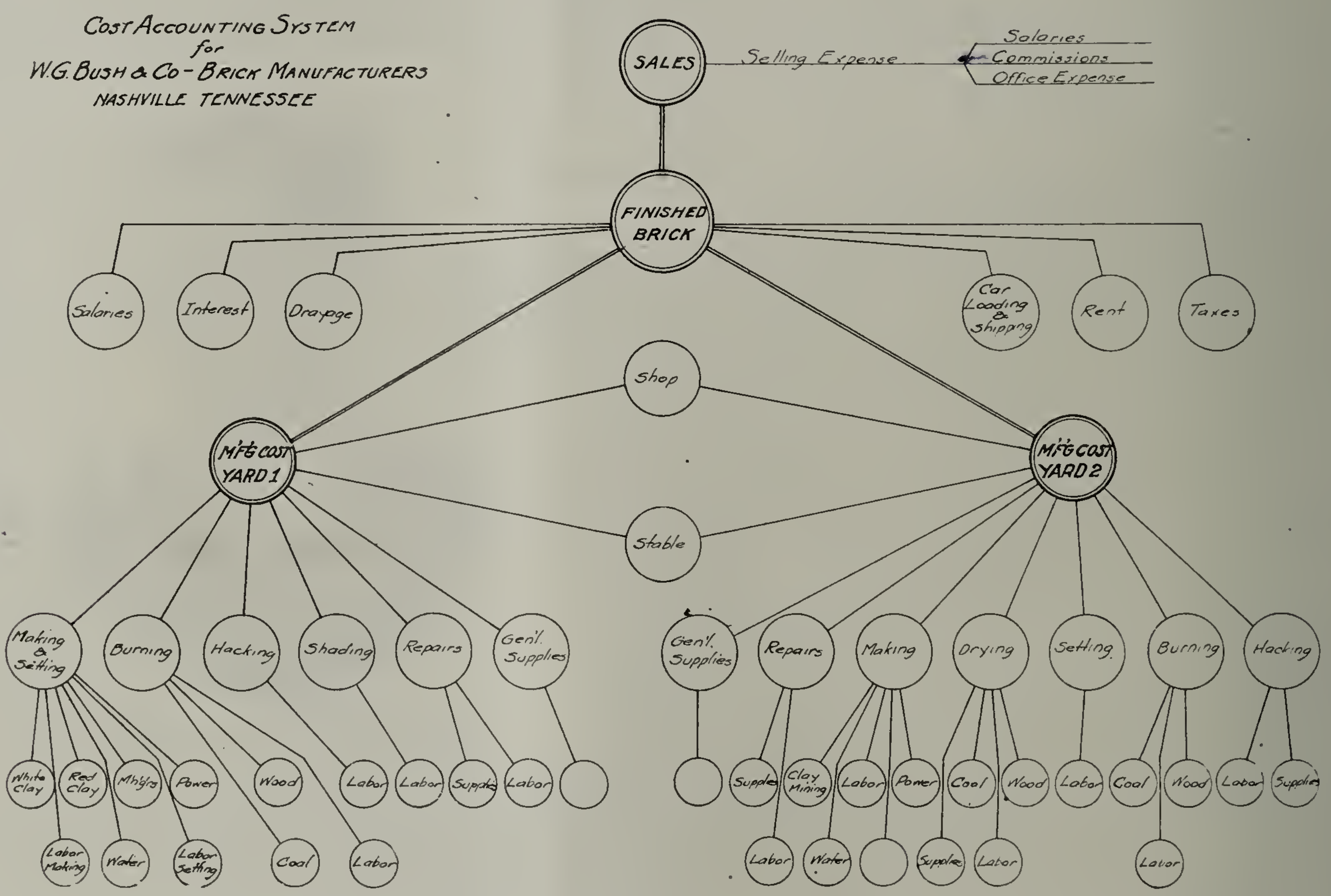
President Deckman: It has been moved and seconded that Mr. Wreford's paper and the discussion which follows same be published in pamphlet form, to be distributed by the building brick bureau. The motion is open for discussion.

Mr. Blair: That will not go very far, and I want to amend it by saying that it shall be a donation from this association to the building brick bureau to be used along with a letter providing for a subscription at whatever amount they want to make it, at 1 or 2 or 3 cents a thousand. So when they get this letter and this pamphlet, they will have to turn this

I will pledge myself to be responsible for all the common brick manufacturers of this city, and will get them to donate their share per thousand brick to the bureau.' (Applause.)

John T. Hummert, Quincy, Ill.: I have had quite an experience in the cutting of price, etc. I have been instrumental in forming what we sometimes call a union, and one time we had a brick exchange, where all brick were sold to one office, and all the brick man had to do was to come and get his money. The office man attended to the sale, etc., and the only cost to members was 10 cents per thousand. The great difficulty, is the brickmakers haven't got confidence in themselves. There is a little jealousy existing among them. I have been in the brick business a good many years, and my experience is that the brick business is a good business when times are good, and it is an awfully poor business when times are bad. Each fellow looks out for himself. If he could bring himself to think that he wanted his competitor, his brother brickmaker, to make money as well as himself, then we could get along. You talk about raising the price of brick 5 or 10 cents a thousand. The question is, can you get them to do it? I got a railroad rate to a certain town of 3 cents. There was a large building going up there, and my competitor had a freight rate of 10 cents. Did my competitor raise their prices? No; instead, they cut the price. It was a $7,000 job, and it was in the winter, and they wanted the job. What do you call local? You ought to get within a radius of fifty miles, and get them together. This has been one of the worst years we have had in twenty years. I did not make as much money this year as I have other years, but I had enough money to come to the convention, and that is more than some of the other fellows have. (Laughter.)

EXHIBIT A



George H. Clippert: We have all had these same experiences Mr. Hummert has given, but you don't want to forget that the brick business of today is on a higher standard and of a different class from what it was a few years ago. Look around this room and you will see a different class of men. I hope everyone will vote for that motion.

President Deckman: If the convention will indulge the chair for just a moment. I have been a watchdog of the treasury myself in other organizations, and, while I am in hearty sympathy with this motion, yet you want to safeguard your treasury in your expenditures. I think it will be wise for the secretary to give us some idea as to the cost of producing this pamphlet.

Secretary Randall: The cost would not be a great deal, but I would suggest that, instead of sending it broadcast to all the brick manufacturers, that we take a selected list of, say, two thousand, and that will not embarrass the association at all.

President Deckman: That is the only question I wanted to bring out, and agree with the secretary that the pamphlet should not be sent out indiscriminately.

George O. Berry, Columbus, Ga.: In a community like my own, for instance, one man could receive the pamphlet and call the other manufacturers together, and then they could reach a conclusion and get a start.

President Deckman: If there is no further discussion of this question, we will now put it to a vote.

(Motion carried.)

W. J. Snyder, Brazil, Ind.: I am not a common brick manufacturer, but I believe we have overlooked the relation of this motion to the amendment, and the remarks on the real question. Some of the gentlemen talk about you ought to have faith. We have all gone to church and heard the minister say that, but we don't have that. Faith, we all know what it is, and have heard it from our childhood. What really was the purpose of this motion? It was the psychology of the whole thing. You ought to have faith, I don't need to tell you that. A person far wiser and better than either you or me told you that, and that was our dear old mothers. We need a practical remedy, and the purpose of that motion is to increase the supply and demand, as oftentimes that is the reason we don't have faith. But if you see a practical remedy that will increase the demand, a man will have faith. If by some program you increase the demand for brick, which you have not done, then gradually you will say, I am getting more money for brick and I will cheerfully contribute 5 or 10 or 25 cents per thousand. That is what these folks pay in Detroit, and they have increased the demand for brick. As Mr. Sibley will bear me out in this other publicity movement in getting the money to spend, it took almost as much money as we gathered to collect the money. I believe in this localization program, but the thought I wanted to bring out was that in a program of this character if you increase the demand, faith will follow. If you begin to have a tangible something—faith, you know, is intangible—unless you begin to get results, your men will begin to hedge. I have learned these lessons, not in brickmaking, but in another industry, one which underlies them all, one with which we could not get our power plants going. I have sat in the councils of the B. B. A. and the Face Brick Associations, and I want to tell you that, above all else, you have got to preach Build With Brick, and anything you can do to pound that into the brain of the American public is money well expended. The cement people are spending twelve million a year for publicity. I used to hunt on the fields of the Atlas Cement plant, and I know something about that plant, and a dozen years ago there wasn't any such plant, and look what they have done in a few years. And we go back ages and ages with brick manufacturing. I saw them in the ruins of Pompeii, and it goes back of that. We are not going to solve these problems by preaching faith—you have got to have something tangible like the work the men in Detroit have done. We have got to have something to start with. These men in Cleveland are making a start, and they have done it in Detroit and down in Indianapolis, Mr. Randall's town. I heard the figures of an expert, and heard him say that at least 75 per cent. of the buildings in this country were made of frame, and all along the road from here to Indianapolis I noticed the majority of houses were wooden houses. It is not because we have not tried. We have tried, haven't we, Mr. Sibley? I stepped out of one of these associations because I thought it was the best thing for me to solve this little problem right in my one spot. We cannot start by solving the problem for the whole United States. We will do it in Cleveland, and New York, and Philadelphia, and Indianapolis, as we have started to, and then, after we have solved this in these localities we will together convince the world that to Build With Brick is the only thing to do. We have started the ball this afternoon, each one of us, let us not deceive ourselves. They have faith in Detroit, because they have had tangible results, and they are going to solve the same problem in Cleveland. I have thought about the problems in every line of industry. You must first solve the problem at home. Pay the money and make the thing a go, that is the tangible solution, and the fact is now that you have taken a little money out of our treasury to start the ball rolling, and I hope we will see that ball grow as large as the cement ball, and the lumber ball, and the steel ball, until it has rolled all over them as brick could do. (Applause.)

EXHIBIT C

KILN RECORD—COST OF BURNING

	KILN NO 1	KILN NO 2	KILN NO 3	KILN NO 4	KILN NO 5	KILN NO 6	KILN NO 7	SUMMARY	EQUIVALENT OF FINISHED	BURNING COST	PER M	REMARKS
JAN. 31ST												
GREEN	118500	Dec.				174400	Dec.					
1/4 BURNT		E		E	E		E					
1/2 BURNT			143200					143200				
3/4 BURNT												
FINISHED	118500					174400		292900	364500	$ 423.58	1.162	
FEB. 28TH												
GREEN		4920	88776					93696				
1/4 BURNT				E	E	E	E					
1/2 BURNT												
3/4 BURNT												
FINISHED	115500							115500	None	$ 40.85		
MAR. 31ST												
GREEN	76124	141864			155732			373720				
1/4 BURNT				151296		E	E	151296				
1/2 BURNT												
3/4 BURNT			140540					140540				
FINISHED									143229	$ 530.70	3.70	
APR 30TH												
GREEN			119784			171980		291764				
1/4 BURNT				E			E	140540				
1/2 BURNT												
3/4 BURNT								151296				
FINISHED	122536	141864			155732			420132	568739	1.00034	1.758	

Mr. Hummert: In response to the gentleman, I wish to state that in our locality I have been doing everything I could. I have been advertising and talking brick, but I insist that we have got to have faith in one another in order to make money for one another. I am not a speech-maker. I am a brickmaker, and I don't need to tell you that flowery oratory will not do the work. You have got to come forward with the cash. I can prove that with the record of the B. B. A. I planked down my money right at the beginning. I am not a back number. I am old in age, but am up to the times. I have spent over a hundred dollars this year in newspaper advertisements and illustrations. The old fellows are with you, you need not be afraid of that. (Applause.)

William B. Wreford: I think we are all in harmony. We have to have enough confidence to come through with our money. If you will all come through and support the national organization, in time the faith will grow. I am sure we are all in harmony if we will discuss this together.

President Deckman: I believe we have given ample time to the discussion of this question, and we will now take up the next number on the program, and I will ask the secretary to announce it.

Secretary Randall: The next number on the program is an illustrated paper, "Elements of Cost in Brickmaking," by R. D. Herbert, of Nashville, Tenn. Mr. Herbert is unable to be here, but he has sent a representative, Mr. I. P. Jones, who will present the paper for him.

"ELEMENTS OF COST IN BRICKMAKING."

BY R. D. HERBERT, NASHVILLE, TENN.

Mr. President and Gentlemen of the Convention:

When we approach the subject of cost, and by cost we mean unit cost, or cost per thousand brick, I realize that many are inclined to view the subject with more or less suspicion and doubt; as to many it conveys the idea of "red tape," delay and expense, with burdensome and complicated records, not commensurate with the value of the results obtained.

We, and when I say "we" I refer to our firm, W. G. Bush & Co., which has been manufacturing brick for over fifty years and has gradually "grown up" with and met the rapidly changing conditions in method of manufacture and the marketing of its product, had such experiences in our efforts to arrive at an accurate knowledge of actual cost, that we had almost reached the conclusion that unit cost on brickmaking was a failure. But we did not give up—and today we feel that we have made a long stride toward a solution of the problem of costs so far as our plant is concerned, and we hope that the results obtained by us will be of interest to you.

In treating the subject assigned me, I want to submit the general results of our efforts without going into the minor details. We are operating three yards, which are designated as yard 1, yard 2 and yard 3. In yard 1 we are making hydraulic-press brick—red, gray and buff—using down-draft kilns; at yard 2 we are making common brick, operating continuous kilns and direct-fired dry houses; while at yard 3 we are making press, rough-texture and common brick. For the purpose of this article, we will consider yards 1 and 2. These yards, though entirely separate, are so situated that the shop and stable expense is divided between them. We pay for all labor weekly, yet we make up cost sheets at the end of each calendar month, as we have found that by doing so, we are able to verify our costs with accuracy and at the same time save office expense.

I present a chart, "Exhibit A," giving a general outline of our accounting methods. This chart practically agrees with our ledger accounts, costs being figured directly from the ledger, and every item on the cost sheet is traceable to the General Balance Sheet, thus eliminating "estimates." Blue-prints of this chart are in each yard office as a guide for the distribution of labor and invoices for material and supplies, so that each item in the cost may be properly distributed at the time of its origin.

The cost sheet is divided to accord with this chart, that is, into Making, Drying, Burning, Hacking Out, etc. Making includes the cost of red clay, white clay, manganese, water, power, and labor. We purchase water from the city water plant. Power, all of which is electric, is purchased from a local power and light company. Clay is all surface-mined; and all mining operations, including steam shovel, mine railroad and the value of clay in the bank, is charged to "Making" at Yard 2, while at the other yards it is charged to a clay account, as all of the clay mined is stocked in the clay sheds. "Drying" includes coal and labor. "Burning" carries, wood, coal and labor. "Hacking Out" Machine Shop, General Yard Expense, General Supplies, Repairs and Superintendence make up our yard cost, and to this is added administration, or overhead. This covers practically all of our elements of cost as shown on cost sheet. "Exhibit B," the data for which comes to our main office in the form of Pay Rolls, Invoices, a Kiln Report and a General Yard Report.

We all know what Pay Rolls and Invoices are, and how quickly they find their way to the cash book, but our Kiln Report is unique in its simplicity and completeness, being simply a record of the condition of the kilns on the last day of the month. The information on this report is taken from the yard record in which is kept the date each kiln is filled, fired, finished and emptied. The data from this report is recorded on the "Kiln Record" kept in the general office and shown here as "Exhibit C." This record gives us a complete check on each kiln and also enables us to ascertain the cost of burning.

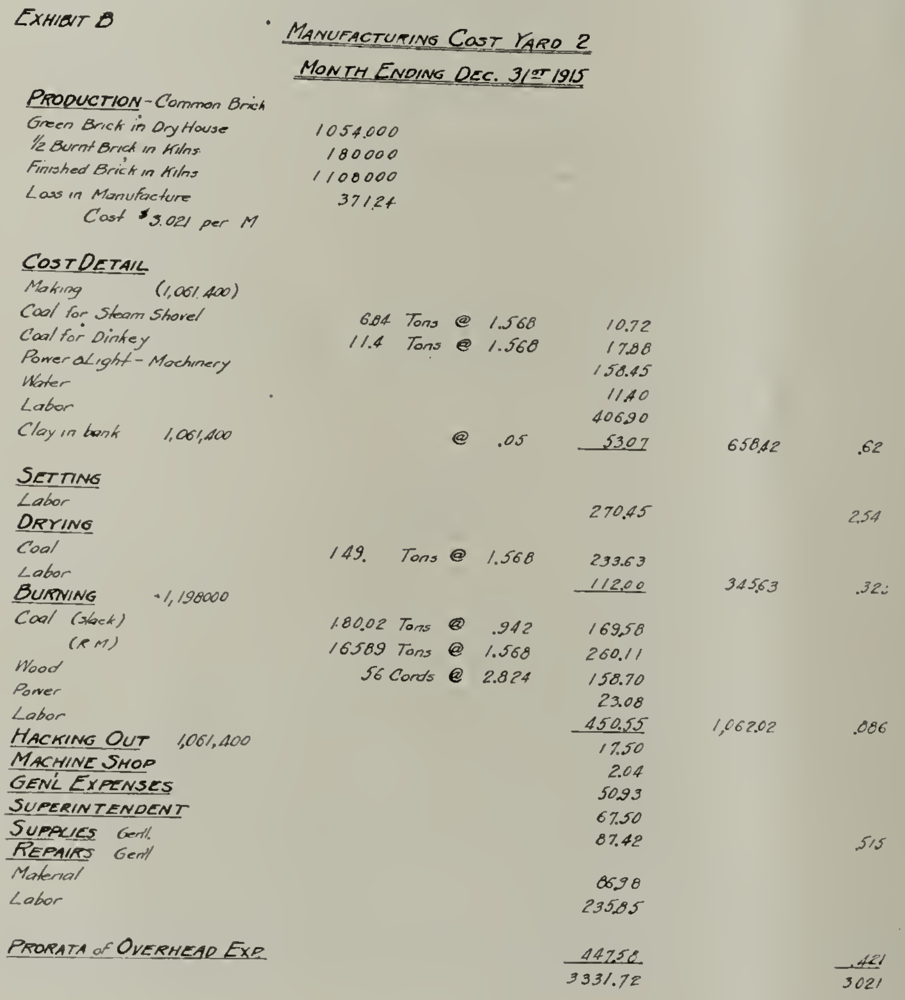


EXHIBIT B

MANUFACTURING COST YARD 2

MONTH ENDING DEC. 31ST 1915

PRODUCTION - Common Brick						
Green Brick in Dry House	1054000					
½ Burnt Brick in Kilns	180000					
Finished Brick in Kilns	1108000					
Loss in Manufacture	37124					
Cost $3.021 per M						
COST DETAIL						
Making	(1,061,400)					
Coal for Steam Shovel		6.84 Tons	@ 1.568	10.72		
Coal for Dinkey		11.4 Tons	@ 1.568	17.88		
Power & Light - Machinery				158.45		
Water				11.40		
Labor				406.90		
Clay in bank	1,061,400		@ .05	53.07	658.42	.62
SETTING						
Labor				270.45		2.54
DRYING						
Coal		149. Tons	@ 1.568	233.63		
Labor				112.00	345.63	.32
BURNING	·1,198000					
Coal (slack)		180.02 Tons	@ .942	169.58		
(R M)		165.89 Tons	@ 1.568	260.11		
Wood		56 Cords	@ 2.824	158.70		
Power				23.08		
Labor				450.55	1,062.02	.886
HACKING OUT	1,061,400			17.50		
MACHINE SHOP				2.04		
GEN'L EXPENSES				50.93		
SUPERINTENDENT				67.50		
SUPPLIES Gen'l				87.42		.515
REPAIRS Gen'l						
Material				86.98		
Labor				235.85		
PRORATA of OVERHEAD EXP.				447.58		.421
				3331.72		3021

For practical purposes we classify the brick in the kilns as green, one-quarter burnt, one-half burnt, three-quarter burnt and finished brick. In continuous kilns this record keeps track of each chamber and is a check on the burning. For illustration we will trace Kiln No. 3. On January 31 this kiln was reported as containing 143,200 one-half burnt brick. On February 28 it contained 88,776 green brick. The 143,200 half-burnt were considered in the burning for December as half-burnt, and for January as half-burnt, and in the January production as finished. The 88,776 green indicates that this kiln was finished and emptied and was being refilled. On March 31 the record shows 140,540 three-quarter burnt, indicating that this kiln was finished filling with green brick and that they were three-quarter burned in March and are so taken in the summary. April 30 reported as 119,784 green, indicates that the 140,540 reported as three-quarter burned in March were finished in April and were taken in the cost for April as one quarter burned. You will note in the column headed "Summary" the 143,200 half-burned is considered in January, that the 140,500 three-quarter burned are considered in March as three-quarter burned and that this 140,540 is brought into April as one-quarter burned.

In order to ascertain the Burning Cost per thousand, we divide the total cost for burning by the equivalent of finished brick. For January we have 143,200 half-burned and 292,900 finished, which would be the equivalent of 364,500 finished brick. The cost, $423.58, divided by this equivalent gives the cost per thousand of burning for January.

The summary for February shows nothing burned, but March shows 151,296 one-quarter burned in Kiln No. 4 and 140,540 three-quarter burned in Kiln No. 3. The 140,540 three-quarter burned equals 421,620 quarters. Add to this the 151,296 one-quarter burned, which makes 572,916 quarters. Divide by four which gives 143,229, which is the equivalent in finished brick. April summary shows the 140,540 from March three-quarters burned as one-quarter burned and 151,296 from March as one-quarter burned as three-quarter burned. Thus we have for April:

One-quarter burned	140,540
Three-quarter burned	151,296
Finished brick	420,132

The 151,296 three-quarter burned is equal to 453,888 brick one-quarter burned; add this to the 140,540 one-quarter burned and we have 594,428 one-quarter burned. Reduce this to its equivalent in finished brick by dividing by four and we have 148,607, which is the equivalent in finished brick. Add this figure to the actually finished brick, 420,132, and we have 568,739, which is the equivalent of finished brick for April. The total cost for burning, $1.00034 divided by 568,739 gives $1.758 per thousand as the cost for burning for April. This method is continued throughout the year. The same process is followed with the continuous kilns in handling the chambers, and with slight modification, the cost of mixed kilns.

Thomas E. Wilson, Pittsburgh, Pa.

In order to keep up with the actual merchantable product, we absorb the several items of waste, i. e., at the machine, in the kilns, in stocking, and in car loading. The actual waste of green brick at the machine and thrown back in the clay, gives us the waste of labor and power, which is absorbed at the machine by reducing the make to the number of good brick for the day, and we look to the foreman to reduce this waste or assign a reason for it—and we all know there are many reasons assigned for this waste.

The waste in the kilns may come from poor setting or poor burning due to atmospheric conditions, etc., and while this is absorbed in the cost of burning, yet the head burner is called upon to explain. The item of waste in shading or stocking and loading is sometimes traceable to burning. While we are dealing with totals, we never lose sight of our unit—per thousand—so if the machine makes 1,000 brick and 900 are set, the cost for the machine register of 1,000 is figured on actual brick, 900. Of this 900, if 100 are lost in burning, the cost of burning is for 800, and if 50 of these are not marketable, we have 750 finished brick from the machine register of 1,000. You will remember that these figures are for the purpose of illustration and not from our records, as our percentage of waste has not quite reached these figures, and at present is getting further and further from them. Our cost in dollars and cents is on the basis of finished marketable product.

The waste handled in this way, holding the department in which it occurs accountable, we have found in making for greater efficiency on the yard. It has put "a watchman on the job," and is taking up the lost motion from the manager to the car loader.

It is not only enabling us to go into the market knowing the cost of our product, but it is also tending to reduce that cost.

It was remarked on the floor of this convention last year "that if every clay manufacturer could know the exact cost of his product for each pay-period, and bring his average cost for the year down to date, it would be the greatest stimulant to prices that we could possibly get. Without a cost system employed in our office, we are bound to let our competitor set our price." I heartily concur in this opinion and feel that as an association we should take active steps in this direction. (Applause.)

President Deckman: The discussion on this very interesting paper was to have been led by Mr. W. A. Howell, of Toledo, but he does not seem to be in the room. He was here earlier in the afternoon, but as the hour is growing late he probably thought we would not reach this paper this afternoon, and we must adjourn in a few moments in order to get ready for the banquet tonight. We will stand adjourned until 9:30 tomorrow morning.

FOURTH SESSION.

Friday, February 25, 9:30 A. M., 1916.

President Deckman: Gentlemen, the convention will come to order. The first paper on the program this morning will be an illustrated paper entitled "Transverse Tests of Brick in Relation to Strength of Piers," by J. G. Bragg, of the Bureau of Standards, Pittsburgh, Pa. (Applause.)

J. Parker B. Fiske, New York, N. Y.

J. G. Bragg: Mr. President and Gentlemen of the Convention: At the 1915 meeting of your association in Detroit, Mr. J. H. Griffith presented a paper on the brick piers which are being tested at the Pittsburgh laboratory of the Bureau of Standards for the N. B. M. A. Mr. Griffith's paper included some twenty piers of the Pittsburgh district. Since that time, because of the unavoidable delays in obtaining materials, we have been unable to do more than furnish the piers of the Pittsburgh district, of which there are about thirty. The bricks from the Chicago district are now being built into piers and will be tested during March. We have, however, prepared the data thus far obtained for final publication, and made a number of supplementary tests on the bricks used in the piers. One of these subjects of supplementary tests has been made the subject of today's paper.

TRANSVERSE STRENGTH OF BRICK AND ITS RELATION TO THE ULTIMATE STRENGTH OF BRICK PIERS.*

BY J. G. BRAGG, ASSISTANT PHYSICIST.

Introduction.

In building practice it is customary to use a large factor of safety where masonry is concerned. Particularly is this true of brick masonry. The reason for this may be attributed in part to the lack of uniformity of the materials used, but for the main part it would seem to be due to lack of sufficient test data to place brick masonry on a safer engineering basis. For practically all other materials of construction some means has been established, whereby structures may be designed without needless waste of material. It is a well-known fact, however, that the usual method of calculating the strength of brick piers does not assure even a fair degree of accuracy. The method most generally used is based on the compressive strength of the bricks used.

On the assumption that the bricks, when built into a pier, fail by crushing, this method would no doubt suffice if it were possible to test a sufficiently large number of samples to obtain a fair average of the compressive strength. In view of the variation to be expected in the compressive strengths of bricks, twenty or more samples should be tested from each lot used to obtain this average. The usual method of determining the compressive strength is by placing a half-brick, either flat or on edge, in a testing machine, having first capped the bearing surfaces of the brick with plaster of paris or cement mortar, after which pressure is applied through the machine heads until the specimen is crushed. This operation will require from fifteen to twenty minutes, depending upon the speed of the testing machine and the accuracy needed. It also requires a testing machine of at least 200,000 pounds capacity, if all grades of brick are to be tested. A half-brick tested flat will sometimes exceed this load. Considering the equipment needed and the time required for such tests, it is not at all strange that so little attention is given to efficient design of brick masonry, when it is known that after all these tests have been made, small dependence can be placed upon them, so far as the ultimate strength of piers is concerned.

Character of Brick Pier Failure..

When a brick pier is tested for compressive strength, several things occur to indicate that instead of crushing, the individual bricks of the pier fail by bending, as they would if they were supported at the ends and loaded at the center. The first indication of failure appears in the form of small hair-like cracks, starting at or near the center of the bricks where the bricks "break joints" with the adjacent courses. These cracks extend almost the entire length of the pier. This is true to a greater or less extent, depending upon the grade of mortar used. With the weaker mortars this action is most pronounced, and in the case of a high grade brick with a lime mortar, the bricks can be heard to crack at various points in the pier until, near the end of the test, these sounds become a continuous "bubbling." As the pier approaches the monolithic structure, having a mortar of practically the same or slightly greater strength than the bricks, it will fail more nearly as a unit, and it is probable that in a pier of this kind, many of the bricks are crushed. In the majority of cases, however, the mortar used has less strength than the bricks and it is believed that in such a construction, the characteristic failure of the individual bricks, is of the transverse rather than crushing type. Assuming that this is true, then, since the transverse strength of a brick varies as the breadth, the depth squared and inversely as the distance between supports, or,

$$P \text{ equals } \frac{K\,bd^2}{L} \qquad (1)$$

in which P equals transverse load, b equals breadth, d equals depth, L equals distance between supports and K is an experimental constant depending upon the grade of material; the strength of brick piers could be increased by increasing the depth of the bricks used.

Tests of brick piers have been made at the Watertown arsenal,* with the result that when the bricks were laid on edge, considerable increase in strength was obtained over piers in which the bricks were laid flat. It was also found that the strength was increased by breaking joints every fourth or fifth course instead of every course. Since the effect of laying the bricks on edge or of breaking joints every fourth or fifth course, was to increase the depth of the component parts of the piers, the tests further support the theory that the individual brick fail transversely.

If we accept the theory that the individual bricks of a pier are subjected to transverse, rather than crushing strains, it seems reasonable to assume that some ratio between the unit transverse strength of the brick and the unit compressive strength of the pier, might exist, which if properly determined would make it possible to estimate with a greater degree of accuracy the ultimate strength of piers.

The brick pier investigation which is being conducted for the N. B. M. A. by the Pittsburgh laboratory of the Bureau of Standards, afforded an excellent opportunity to investigate the strength of bricks, with a view to establishing some such ratio for piers of the size included in this investigation. This has been done on the piers thus far tested and some interesting results obtained.

Procedure of Tests.

The piers tested were of a size commensurate with engineering practice, being 30 inches by 30 inches by 10 feet high. No undue

(By permission of the Director of the Bureau of Standards.)

*See tests of metals, Watertown arsenal, 1884-1893.

refinements were introduced in their construction, such as eliminating warped bricks or screening the mortar material to decrease the thickness of joints. They were on the contrary, built as nearly as possible to conform with accepted practice, the specifications being quite similar to those ordinarily submitted to the contractor. The cement mortar piers were tested when one month old and the lime mortar piers were tested at the age of four months. The results of the pier tests are shown in Table No. 1. They are discussed rather fully in the March, 1915, issue of the Clay-Worker.*

For the transverse tests samples were selected at random from the various lots of bricks used in the piers. Each specimen was prepared for test, by placing on a planed surface two ¾-inch by 4-inch steel strips, so that they were parallel, with their respective centers 7 inches apart. The strips were then buttered with plaster of paris and the brick pressed down upon them. When the brick was placed in the machine for test, these strips rested on round steel bars of ¾-inch diameter, thereby furnishing roller bearings for the end supports. A third roller of ¾-inch diameter was laid across the brick at the center. A small spherical bearing block rested on top of this roller through which the load was applied. (See Fig. 1.) While some system of supporting the specimen and applying the load, which makes use of point bearings at the ends and center of the specimen, is more generally approved, the method used is sufficiently accurate for the purpose of this investigation, since it reduces the possibility of uneven bearing due to warpage to a minimum.

J. G. Bragg, Pittsburgh, Pa.

*See progress report, "Tests of Large Brick Piers," by Griffith & Bragg, report of 29th convention N. B. M. A., Clay-Worker March, 1915.

Definitions and Formulas.

In order that the strengths of specimens of different sizes may be compared, it is necessary to reduce the strengths to the same unit. In the transverse and crushing tests this unit is called stress and is expressed in pounds per square inch. From the crushing test it is obtained by use of the formula,

$$S \text{ equals } \frac{P}{A} \qquad (2)$$

in which S equals stress or unit compressive strength, P equals load on specimen and A equals the number of square inches of top bearing surface (for specimens of uniform section only). For the purpose of this discussion it will be referred to as unit compressive strength and will be understood as meaning, the breaking load in pounds sustained by each square inch of bearing surface as above defined.

The unit obtained from the transverse test is known as the modulus of rupture and is calculated by means of the following formula:

$$M \text{ equals } \frac{3\ PL}{2\ bd^2} \qquad (3)$$

where M equals modulus of rupture, P equals breaking load. L equals distance between supports, b equals breadth and d equals depth. In the tests made under this investigation the distance

RESULTS OF PIER TESTS

PIER NO.	UNIT COMPRESSIVE STRENGTH	STRENGTHS SHOWN DIAGRAMATICALLY GRADES A ■ B ▩ C ▨	ARRANGEMENT OF COURSES HEADER: STRETCHER	MORTAR	AGE
1	2710	■	1:1	1 CEMENT 3 SAND	30 DAYS
2	2740	■	1:2		
3	2900	■	1:5		
4	2000	▩	1:1		
5	2070	▩	1:2		
6	870	▩ ⊗	1:5		
7	510	▨	1:1		
8	560	▨	1:2		
9	650	▨	1:5		
10	3820	■ ⊗	1:1	1 15% LIME 85% CEMENT 3 SAND	30 DAYS
11	3230	■ ⊗	1:2		
12	3310	■ ⊗	1:5		
13	1760	▩	1:1		
14	870	▩ ⊗	1:2		
15	1760	▩	1:5		
16	1450	■	1:1	1 LIME 6 SAND	4 MONTHS
17	1270	■	1:2		
18	1360	■	1:5		
19	840	▩	1:1		
20	890	▩	1:2		
21	990	▩	1:5		
22	210	▨	1:1	1 LIME 3 SAND	4 MONTHS
23	178	▨	1:2		
24	126	▨	1:5		
		PIERS OF 2ND LOT OF BRICKS			

TABLE NO. 1

RATIOS.

BRICK CLASSIFICATION.	MORTAR USED	LOT NO.	NO. OF TRANSVERSE TESTS MADE.	(A) AVE. UNIT TRANSVERSE STRENGTH	BRICK PIERS TESTED. (REG.) (NO.)	(B) AVE. UNIT COMP. STRENGTH OF PIERS.	RATIO $\frac{A}{B}$
A	1 CEMENT : 3 SAND	1	20	1945	1-2-3	2780	.7
	1 (15% LIME, 85% CEMENT) : 3 SAND	2	20	2780	10-11-12	3450	.8
	1 LIME : 6 SAND	1		1945	16-17-18	1360	1.4
B	1 CEMENT : 3 SAND	1	20	1370	4-5	2040	.7
	1 CEMENT : 3 SAND	2	20	670	6	870	.8
	1 (15% LIME, 85% CEMENT): 3 SAND	1		1370	13-15	1760	.8
	Do. Do. Do.	2		670	14.	870	.8
	1 LIME : 6 SAND	1		1370	19-20-21	907	1.5
C	1 CEMENT : 3 SAND	1	10	345	7-8-9	573	.6
	1 LIME : 3 SAND	1		345	22-23-24	171	2.0

TABLE NO. 2.

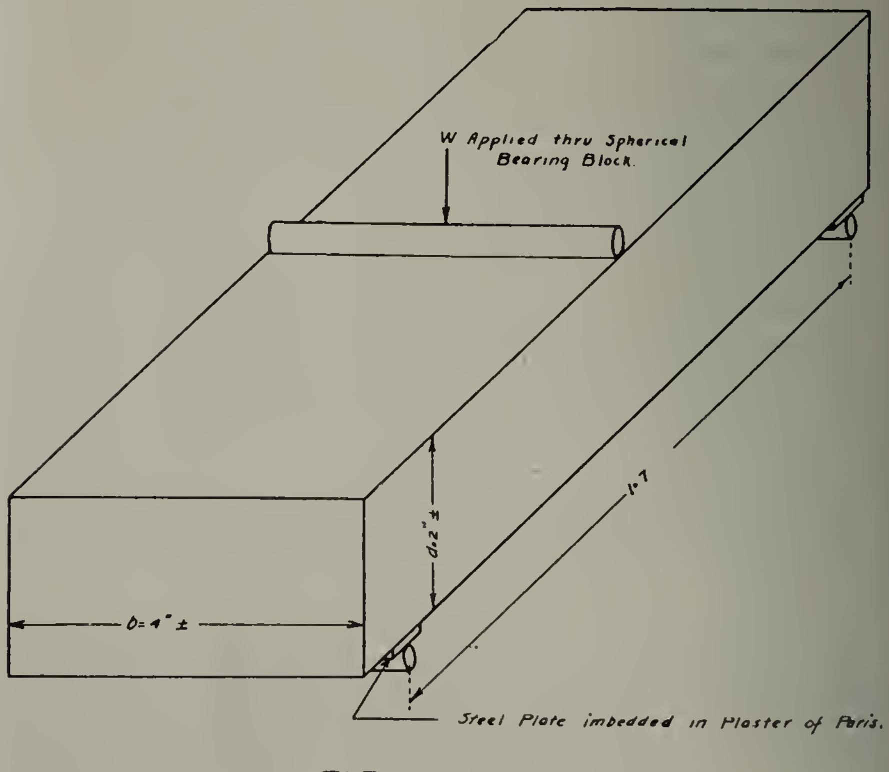

W Applied thru Spherical Bearing Block.
d=2"±
l=7"
b=4"±
Steel Plate imbedded in Plaster of Paris.

FIG. 1

between supports was in all cases 7 inches which reduces the formula to

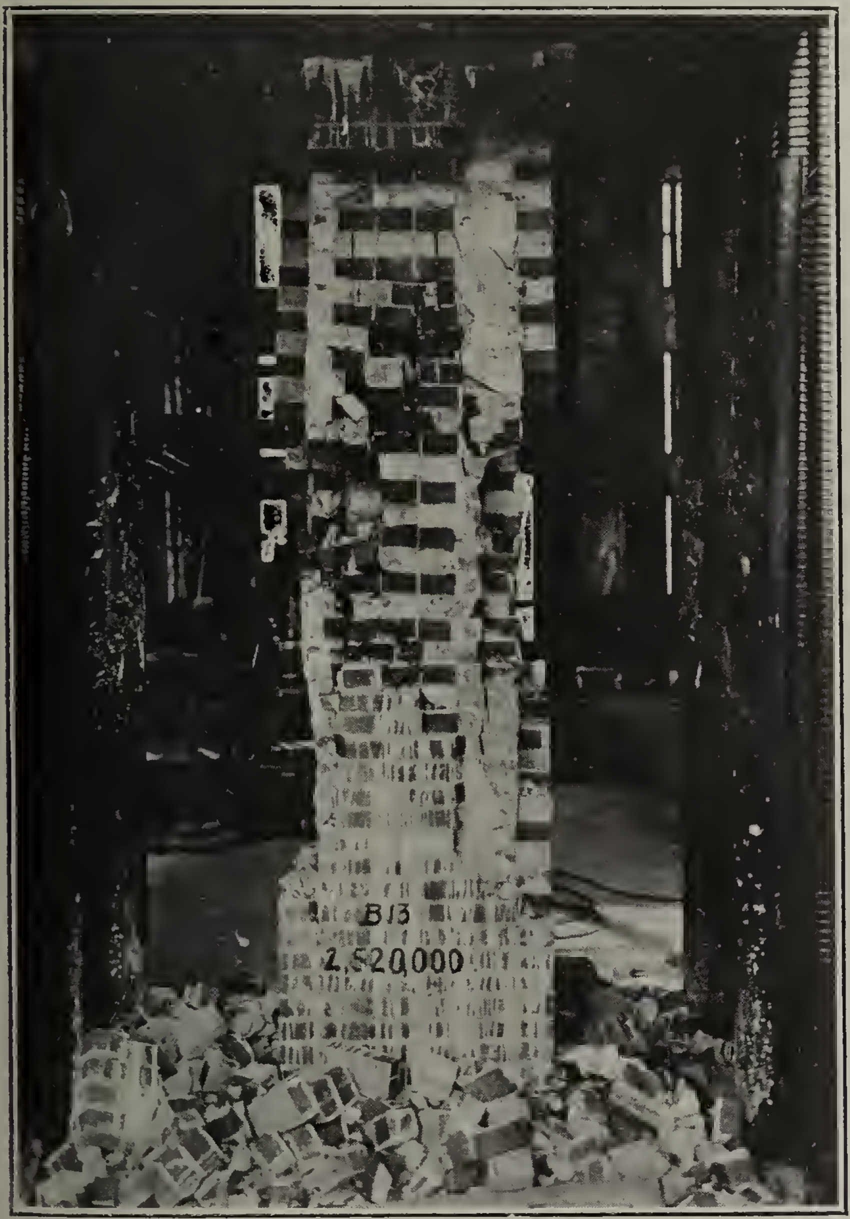
$$M \text{ equals } \frac{10.5xP}{bxd^2} \quad (4)$$

Two-thirds of this value of M is the constant used in formula (1) and M will hereafter be referred to as the unit transverse strength. It is sufficient to define the unit transverse strength, as being an experimental constant obtained by use of the general formula (3).

The ratios obtained by dividing the average unit transverse strengths of the various grades of bricks used, by the average unit compressive strengths of the piers tested, are the subject of the following discussion and are shown in table No. 2.

Discussion of Data.

An effort was made to classify the bricks used in the piers, according to the American Society for Testing Materials tentative specifications (1913). It was desirable also, that each kind of brick used, be ordered in one lot to insure a more nearly uniform grade of brick from each manufacturer. Neither of these rules could be strictly adhered to, however, with the result that the brick not only fall outside the classifications to which they nominally belong, but there were used two different lots or shipments of both the A and B classifications brick. In both cases, however, the 2nd lot was obtained from the same manufacturer as the first lot, and in the case of the A grade bricks there was no appreciable difference in the appearance or compressive strengths of the two lots, the average unit compressive strength of the first shipment being 11,990 pounds per square inch, as compared with 11,965 pounds per square inch of the second shipment. The second lot of B grade bricks appeared softer and showed a compressive strength of about one-third that of the first lot, the unit compressive strengths being 2,450 pounds per square inch, and 7,900 pounds per square inch, respectively. Assuming that the compressive strength of the individual bricks, is indicative of the ultimate strength of a pier, we would expect no difference in the strengths of the two lots of A grade piers unless it be due to a difference in the mortars used. We would, however, expect only about one-third the strength on piers built of the second lot of B grade bricks, when compared with those of the first lot. That this reasoning is incorrect is shown on table No. 1.



Class A. Ultimate Effect of Vertical Cracking.

Class B. Maximum Load, 1,545,800 Pounds.

The piers built of the second lot of A grade bricks show a marked increase in strength over those in which the first lot were used, the only other variable being a slight difference in the two mortars. The first lot were laid in a one part cement to three parts sand mortar, while those of the second lot, were laid in one part (15 per cent. lime and 85 per cent. cement) to three parts sand mortar. The ingredients of the mortars were proportioned by weight and little difference if any could be attributed to this variable, but when the strengths of the cement mortar piers are compared with those in which the lime mortar was used, a decrease rather than an increase in strength would be expected with the combination lime and cement mortar. In the case of the piers built of the second lot of B grade bricks the strength has decreased about one-half when compared with the first lot, instead of one-third as was expected. When the modulus of rupture or unit transverse strengths of the several lots are compared, however, (see table No. 2) it is seen that the average transverse strength of the second lot of A grade bricks is 800 pounds higher than that of the first lot, and since the ratios shown decrease with the stronger mortars, the cement mortar is shown to be slightly more efficient than the combination cement and lime mortar. Likewise in the case of the B grade bricks, the average unit transverse strength of the second lot of bricks is very nearly one-half that of the first lot. The corresponding ratios, i. e., the ratios corresponding to the same mortars, agree very closely among themselves and are independent of the grade of bricks used. Some difference is apparent in the ratios due to the difference in the number of results averaged in computing the ratios. This difference is very apparent in the C grade bricks, there being only enough bricks on hand to make ten transverse tests instead of twenty. By suitable averaging of twenty transverse tests in groups of five and ten, it is evident that at least twenty tests should be made to obtain a fair average. No agreement could be expected, however, between the ratios computed from the C grade bricks laid in lime mortar, and A and B grades laid in lime mortar, since the mortar used in the C grade piers was one part lime to three parts sand as compared with one part lime to six parts sand in the A and B grades.

Conclusions.

It would be necessary of course, in the establishment of such ratios to conduct an investigation of considerable magnitude, on brick piers of various sizes, in which were used the different mortars corresponding to building practice. It is believed, however, that the results obtained in the present investigation are of special significance since they were obtained on piers of a quite practical nature.

The transverse test requires a testing machine of about 1/20 the capacity needed for crushing tests, and with suitable apparatus for supporting the bricks at the ends and applying the load, much less time is consumed in preparing the samples for test. An operator can make three to four transverse tests in the time required to crush a single half brick.

Additional data is needed to justify the assertion that a ratio based on the transverse tests of bricks could be established which would be of material assistance in estimating the strength of brick masonry. The transverse test will, however, prove far more satisfactory in this respect than the crushing test, if we consider the results obtained in the present investigation.

There would seem to be no question whatever as to the desirability of having a more efficient method of computing the strength of brick masonry, based on a simple laboratory test which would require a minimum amount of time and equipment. It is the opinion of the author that such a method based on the transverse test could be established which would satisfy the requirements as to reliability, at the same time greatly simplify the work of the laboratory. (Applause.)

Prof. Edward Orton: Did you see any single brick crush or was it just the crushing of the piers?

Mr. Bragg: Not generally. I intended to say something about that. I think, Prof. Orton, if you had a more nearly monolithic pier—that is, take your weaker brick, for instance, and extremely strong mortar, and you would no doubt get quite a lot more crushing of the brick, but in general there is very little crushing action. The transverse failure was most pronounced in the piers which were built of A grade.

Elisha J. Kane, Kushequa, Pa.

Marion Blair: Is that the strongest brick with the weakest mortar?

Mr. Bragg: Yes.

Marion Blair: Would not a strong brick, and a strong mortar give a better pier? You possibly don't understand what I am driving at, but I have heard recently a number of papers read on the strength of concrete and mortar, especially for road materials, and I was wondering if, for extreme cases, where extreme strength is required to support an unknown load, whether the maximum strength of a brick pier such as occur in mines, could not be obtained by a selection of a maximum strength mortar and a high grade brick. For instance, in these piers all the tests were made with a mortar of the same composition and the same characteristics. Did you have a test of the mortar separately for tensile and crushing strength?

Mr. Bragg: Undoubtedly you would have a pier of maximum relative strength if you used the best grade of brick with the strongest mortar obtainable. No tests were made on the mortar used.

Mr. Blair: In my judgment, there is a vital error in this investigation, because, owing to the variations in the nature of sands, we have mortars of varying strength. Sands that are available for use in one part of the country cannot be used in another part of the country owing to the freight rates, and yet if you wanted to lay up an extra strong pier, and knew by using a stronger mortar you would get what you were after, you might feel justified in paying more for the kind of sand necessary to give the results wanted. If you can show by your experimental work that the sands in the mortar have something to do with the strength of the piers, if you can show that you can increase the maximum strength of these piers by a different mortar, then I think you would be doing a good work. On the other hand, if a man can go to any old sand bank and get a sand for his mortar with which to build his piers, it would be something we ought to know. On the other hand, if a man builds a pier with a mortar made of this low-grade sand and it fails, if we can show him that it would not have failed if he had used the proper proportions and the proper care in the selection of his mortar, then we would have something that would be of real benefit.

Mr. Bragg: It might be well to make some tests, as a matter of record, on the mortar used. It is not too late to do this, as the materials used are available. However, tests have been made on sands from all parts of the country with a view to determining the proper proportion to use in mortars, and various other tests of this nature have been made, so that now it is a very simple matter to select from the materials available the best mortar for the purpose.

Mr. Blair: Where did you obtain the sand that was used in these tests?

Mr. Bragg: The sand was Allegheny River sand from the Pittsburgh district.

Mr. Blair: Some time ago I listened to a paper on the strength of cement and sand bricquettes, one of which showed exceptional strength. The question was raised: What was the difference in one bricquette that made it so much stronger, and the gentleman reading the paper said, "I forgot to mention that. We used a different cement in that particular one, which may account for it." The point is that tests showing certain strength without knowing how that strength was obtained, are without value. Suppose one did not want a maximum strength in these piers and could get a sand in the immediate vicinity of the work at $0.00 a ton, and could show the engineer in charge that the sand which could be obtained within a couple of hundred yards of your work from a sand bank would answer his requirements of strength, then it becomes a dollars and cents proposition, whether to use that sand or whether the specifications would compel him to ship the sand in a couple of hundred or a thousand miles. There are places where a high-grade sand is a mighty scarce article, whereas there are some points where there are sands available which would give all the strength required in that pier job at a considerable saving of money. Of course, one might sometimes find a sand rock in the vicinity of the work that could be crushed and used for mortar purposes, if it would answer the requirements, without going to a river one hundred or one hundred and fifty miles away to get it to the job, and there again it is simply a matter of dollars and cents.

Mr. Bragg: Actually, I think that mortar tests in connection with these piers is of small importance. I do not believe that a builder would be justified in going to extremes to obtain a high-grade sand, unless the sand of his own locality was an exceptionally poor grade. The best which could be done in the case where a useable sand was available would be to use that sand in proper proportions best suited to the materials at hand.

Mr. Blair: You do not know it; you think it.

Mr. Bragg: It would not be practicable to try and determine all these different phases of the mortar on an investigation of this size and kind. It could be determined as well on test specimens of smaller size. Your committee on technical investigation realized in taking up an investigation of this kind that there were a great many minor variables which would have to give way to the more important phases of the subject with which they were dealing. The mortars used were selected with a view to include three of the representative mortars in common use.

President Deckman: We will have to limit the discussion of these papers. While they are all very interesting, the discussions can be continued later between those who are especially interested. Are there any other questions to be asked Mr. Bragg before we pass on?

Elisha Kane, Kushequa, Pa.: The starting of the crack was shown very clearly to have come from the transverse action, as partly due to the crushing of the upper side of the brick and partly to the expansion below. Have you any idea as to the relation the mere tensile strength would be when the crack started? After that I should think it would be largely a question of tensile strength as to whether it shall extend to the brick higher.

Mr. Bragg: The transverse test is a measure of the tensile strength in the extreme outer fiber of the brick on the side opposite to which the pressure is applied. When the pressure applied is of sufficient magnitude to overcome the tensile strength in the outer fiber of the brick, failure occurs, and so far as that particular point of the brick is concerned it is no longer capable of withstanding pressure applied transversely. When a failure of this kind takes place in a brick which is built into a pier, the crack which appears at failure would extend all the way through the brick if the brick was not restricted by the adjacent courses. So it is not a question of what the brick is capable of withstanding after this crack appears. After one or more of the bricks have failed in this manner, it is doubtful just what effect it has on the adjacent bricks, but it is quite probable that it has a tendency to produce the same action there. The general tendency, however, is for these cracks to become confluent and extend the entire length of the pier.

Mr. Kane: The only question is whether tests have been made on the mere tensile strength of the brick, because when the crack did start its further expansion would be much more largely a question of the tensile strength in the crushing of the upper side.

Mr. Bragg: In such a test you would experience great difficulty in securing the brick in the testing machine. It could be done on test specimens of special shape such as is used for tensile tests of cement.

H. C. Kenyon, Charleston, W. Va.: Was there anything said about bond? Would a Flemish bond make a pier any stronger?

Mr. Bragg: Perhaps I have gone ahead on the assumption that you were familiar with the report by Mr. Griffith at the last convention. The subject of bond was discussed rather fully in this report. The bond used in these piers was as follows: (1) Alternate header and stretcher course; (2) one header course to three stretchers; (3) one header to six stretchers. So far as we have gone the number of header courses used seems to have very little, if any, effect on the strength of the piers. In some cases the piers having the fewest header courses showed higher strengths than those in which alternate header and stretchers were used. In other cases the reverse was true. As to the relative merits of the Flemish bond, I can see no reason why it should either increase or decrease the strength. The Flemish bond, I believe, is used more for the architectural effect rather than any advantage it may have over other bonds in so far as strength is concerned.

Prof. Orton: I think it is two years ago, or possibly three years ago, that this pier work was taken up by this association. Of course you all recognize that this report just made is the Bureau of Standards' report on the N. B. M. A. work, so we have a proprietory interest in the work. If I recall the circumstances correctly, the start of this matter came from the fact that Mr. J. E. Howard came to us with a lot of photographs of piers which he had made at the Watertown arsenal. He had used certain photographs, and some one asked him a question about how the piers had been laid up and he admitted that the conditions of laying the piers, the quality of mortar, manner of laying, choice of brick and all that had been made with very little regard to what would actually happen in building the piers anywhere. And on that point Mr. Will P. Blair and myself proceeded to get active. We both thought we ought to have some pier data that would be valuable all over the country and reflect closely the actual conditions, including the quality of brick and the quality of mortar available, so that any engineer who wanted exact data as to piers, etc., could get it. The bureau has worked on this thing some two years, and they are practically in sight of the end. Now, while we recognize the presentation we had last year from Mr. Griffiths and this year from Mr. Bragg are not conclusive, we can see the work they are doing, and we must not judge of this work from what can be said in the association once a year. When the work was started we asked for brick from three different districts, Chicago, Pittsburg and the East, and these have been tried out with three different kinds of brick, three different kinds of mortar, and different kinds of bond. With the character of failures and the strength all carefully systematized and the work put in a regular publication of the Bureau of Standards, in collaboration with ourselves, we will have a piece of work of which this association can be proud.

Honors for Professor Orton and Professor Bleininger.

Secretary Randall: I would like to inject a little matter here. I guess you all know without my saying so that the men behind this technical work, and have been behind it for years, are Prof. Edward Orton and Prof. Albert Bleininger. These two men have done a great deal of work in behalf of and for this association and in the interest of the brickmakers of the country. This is rather a long deferred honor, but I want to move at this time that we recognize their splendid service and deep interest in this work by making Professors Edward Orton and Albert V. Bleininger honorary members for life, of this association. This really should have been done years ago. They have had the co-operation of the members of the technical committee, but they have been the men behind all this work. I hope this motion will be adopted by a rising vote.

Charles H. Bray, Helena, Mont.

M. E. Gregory: I second the motion.

The motion carried by rising vote.

Will P. Blair: May I have just a moment in which to make an announcement. I have here in my hand a road map of the United States that has been sent out by Mr. Charles Henry Davis, of Boston, Mass., with his compliments, to the members of this convention. This map is very interesting just at this time, in view of the fact that the Shackleford bill has just passed the lower house of Congress by a vote of 181 to 81, and I would be very glad to have every member here accept one of these maps with the compliments of Chas. Henry Davis, of Boston, Mass.

President Deckman: I will ask the secretary to announce the next number on the program.

Secretary Randall: The next number on the program is an illustrated paper by E. C. Hillyer, of Raleigh, N. C., on "Efficiency Engineering for Brick Plants." Mr. Hillyer is confined to his home by illness, but Mr. A. R. D. Johnson, who is associated with Mr. Hillyer in business, has the illustrations and will present the paper for Mr. Hillyer.

"Efficiency Engineering for Brick Plants."

A. R. Johnson, Raleigh, N. C.: I know we are considerably pushed for time, and so, instead of reading Mr. Hillyer's formal paper, I think it will be just as well for me just to show the illustrations and explain them to you at the same time and let the paper be printed in the proceedings.

EFFICIENCY ENGINEERING APPLIED TO A 100,000 CAPACITY PLANT.

BY E. C. HILLYER, RALEIGH, N. C.

Mr. President and Gentlemen of the Convention:

Our purpose is not simply to describe a plant proper in which radical departures from accepted practice had been successfully introduced, but rather to treat the subject of brick business economics, from the broader viewpoint of all controlling factors; the article is somewhat "bulky," this, however, is characteristic of brick yards generally, first cost inclusive, but in this particular case the accumulations of a lifetime to be spent, were somewhat shy on the three dimensions of length, breadth and thickness, yet had to cover a lot of space. The story is told of problems met and overcome, emphasizing the value of "team work," the subordinations of personal preferences, and the resourcefulness of engineering talent unhampered by tradition, believing that innovations of proven worth to us, should be placed before the fraternity for consideration. As efficiency was to reign not only over the plant proper, machinery, buildings, dryers, kilns, etc., but to apply also to fuel supply and its distributions, character, and well-being of employes, rail transportation and side track facilities, and the handling and marketing of the product, a resume of the conception, evolution and revolution of the plant may also be of interest.

A. R. D. Johnson, Raleigh, N. C.

The Johnson & Johnson Company, of Raleigh, N. C., had been operating a plant near Raleigh for a number of years; this plant on leased land, with temporary buildings and shelters, but equipped with modern machinery, had under the able office management of the Johnsons and Mr. O. C. Kennedy, plant superintendent, been very successful. On account of a growing business and the limited clay supply, they however decided to build a new plant of larger capacity.

Efficiency began with the location of the plant, determined mainly by five controlling factors:

1st—An inexhaustible supply of fine brick clay.
2d—Railway transportation facilities.
3d—As a competitive distributing point for marketing the product.
4th—From the standpoint of intelligent, reliable labor.
5th—Cheap reliable power.

After months of investigation and search, all these conditions were met by a location on the Cape Fear River bottoms, 33 miles from Raleigh, on the main line of the Norfolk-Southern R. R. They were what may be termed "safety first" conditions, underlying principles on which a successful business could be built with "brick the everlasting material." Nothing was left to chance. Numerous borings of clay beds were made, and the material worked and burned at the Raleigh plant, samples were taken to the Ceramic School in Illinois, where exhaustive tests were made.

The location as a competitive distributing point was carefully figured out from the standpoint of the brick absorbing capacities of the surrounding cities and towns, on a mileage basis, and controlling freight rate. The "strategetic" position of the two plants 33 miles apart was, also, a factor; direct connections with the Southern, Seaboard Air Line, Norfolk-Southern and Atlantic Coast Line Railway systems affored average transportation facilities to competitive points on more than equal terms.

The "power" requirements were met by a contract with the Carolina Power & Light Company for 450 electric horse power from their Cape Fear hydro-electric station, a private five-mile high tension transmission line to deliver current to the plant transformer station at 33,000 volts, and there reduced to 550 volts for distribution to individual motors in various parts of the plant.

The labor problem was solved by a canvass of the surrounding farming community; during the construction period, reliable men with good habits were to be picked out and trained, as it were, for the positions they were to fill. To acquire the clay lands it had been necessary to also purchase several hundred acres of adjoining farming land, on which houses were to be built, orchards planted, water and electric light systems installed, drainage and hygenic conditions looked after, and facilities furnished for gardening and the raising of home supplies. Employes with comfortable surroundings, steady work, good wages, and the attachments of "down home" would be an asset to the company of great value.

Steam Shovel at Work.

Permanent Fuel Tracks Between Kilns.

The Johnson Brothers, although interested in other local enterprises, decided to subordinate these interests to the building up of the brick business; the details of the new plant therefore received the most careful consideration, based not only on personal practical experience, but also on exhaustive investigations of other methods and systems. President A. R. D. Johnson spared neither time nor expense, and made many trips to investigate at first hand the merits of various processes, kilns, dryers and machinery under consideration.

Finally, with the co-operation of the Chambers Brothers Company, a lay-out was decided on and working plans made. This design was probably the "last word" in brick plant construction along conventional and time honored lines; after all was said and done, however, they contemplated the daily handling by common labor of some twenty tons of coal to 184 kiln and dryer furnaces, some 300 tons of dried brick into the kilns by "tossing," the loading into cars of a like amount of burned product by wheelbarrow, or gravity carrier, the placing and removal of the platen, bats, ashes and debris; the rehandling of salmon brick when not needed for immediate shipment, and the handling and burning of repressed brick in separate kilns, all by similar methods.

At this state of development, Mr. E. C. Hillyer, also of Raleigh, became interested in the brick proposition. He was associated with the Johnsons in other enterprises, and was by profession a mechanical engineer, but, as to the brick business. was a "rank outsider" and had never seen the inside of a brick yard. One short visit. however, to the Raleigh plant was sufficient to photograph, as it were, on his mechanically trained mind, the general lay-out of a brick yard, process of manufacture, duty and relative location of the various machines and departments.

Off-Bearing Shed.

Setting Brick from Turntable Platform.

Looking over the scene, which seemed to portray a disputed factory site between the trenches of Belgium, Hillyer communed with himself thusly: If this be a "mint," how about the new plant equipped with labor-saving appliances in conjunction with the Cape Fear site and operative surroundings? His inventive and mechanical instincts were roused; the daily handling of some 600 tons of material was firmly intrenched and barricaded by the traditional practice of a century, "toss 'em in" and "wheel 'em out," he could not resist, and with visions of untold gold he decided then and there to join the Johnsons.

The Cherokee Brick Company was organized with the following officers: A. R. D. Johnson, president; E. C. Hillyer, vice-president and engineer; C. A. Johnson, secretary and treasurer; Z. V. Peed, sales manager; O. C. Kennedy, plant superintendent. A council of war was held and the accepted plans gone over with a fine-toothed comb from steam shovel to loading-out platform. Probably no better "combination" of talent within their capacities could have been chosen to thrash the matter out. It was team work and a mutual appreciation of the value of specialized experience gained at first hand.

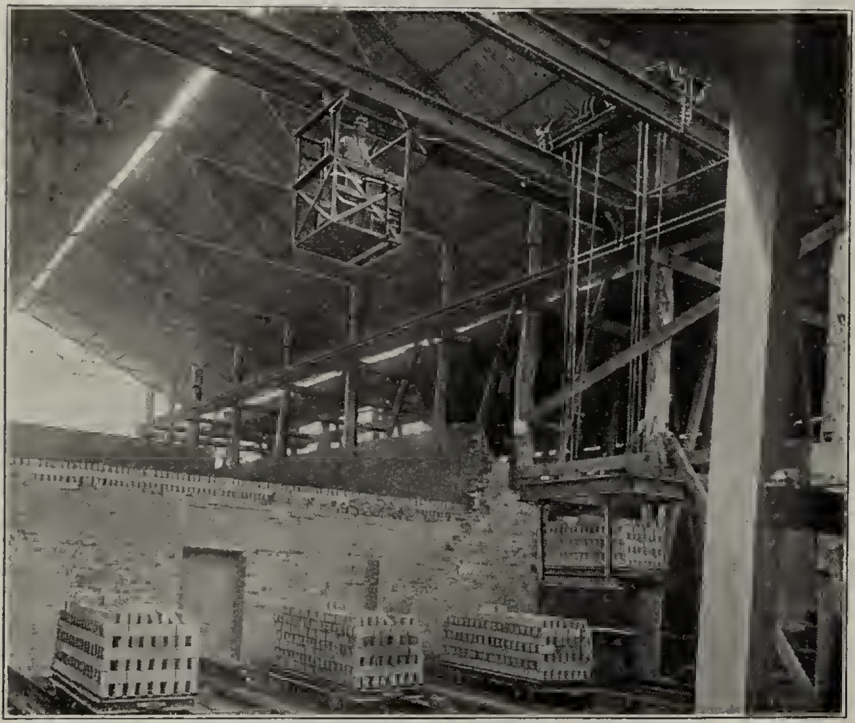
Lowering an Empty Car.

The Johnsons poured out the story of the building up of the old plant, with its alterations, additions and shortcomings, and eight years of accumulated "office" experience with the problems of transportation, labor, weather conditions, production, marketing, rush orders, prices, competition, etc. Kennedy was fidgeting around on his chair while listening to these minor troubles, and finally broke loose with the real article. He had been wrestling for years with dirt bats, ashes, temporary shelters, mules, casings, niggers, fuel, carts and other troubles too numerous to mention. Peed, Salesman was calmly reminiscent, these were none of his funerals, he was listening to the vocies of irate customers, and recalling examinations of various and sundry cars of "all hard" which seemed off color, ond other cars with an undue sprinkling of salmon, bats and bench, three weeks behind time. The selling end had its troubles, also. This reminds me (a little monkey business) an old farmer looking over the acres of buildings and machinery at the Brickhaven plant. and after listening to the hundreds of thousands that could be made, burned and dried each day, finally said, "But, tell me, whose job is it to sell one hundred thousand a day" Our answer would now be, Zebulon Vance Peed. Peed had toted bricks around in his satchel until his left shoulder slanted down like a depressed siding, but when he went after a brick job, the other fellows might as well pack their grips or prepare to take a loss. Yes, Z. V. Peed'll sell 'em. His simple prayer was that we get fixed to make brick, then ship them on time, and according to orders. Hillyer finally caught the idea. These brick were to be made without cost to us, were to be touched only with kid gloves, and then handed to the buyer on a silver waiter with apologies for any slight accumulations of dust, cinders, etc. With a long and varied experience in the building and operation of power plants, and confronted with concrete problems put up to him by his associates, it was with him, however, simply a matter of applied mechanics and the adapatation of well-known and widely-used mechanical appliances to operative conditions usually hard to meet. After listening to the trials and troubles of the brick business, and the requirements of the ideal plant, he began to realize, however, that he was "up against it," and that it was a man's job.

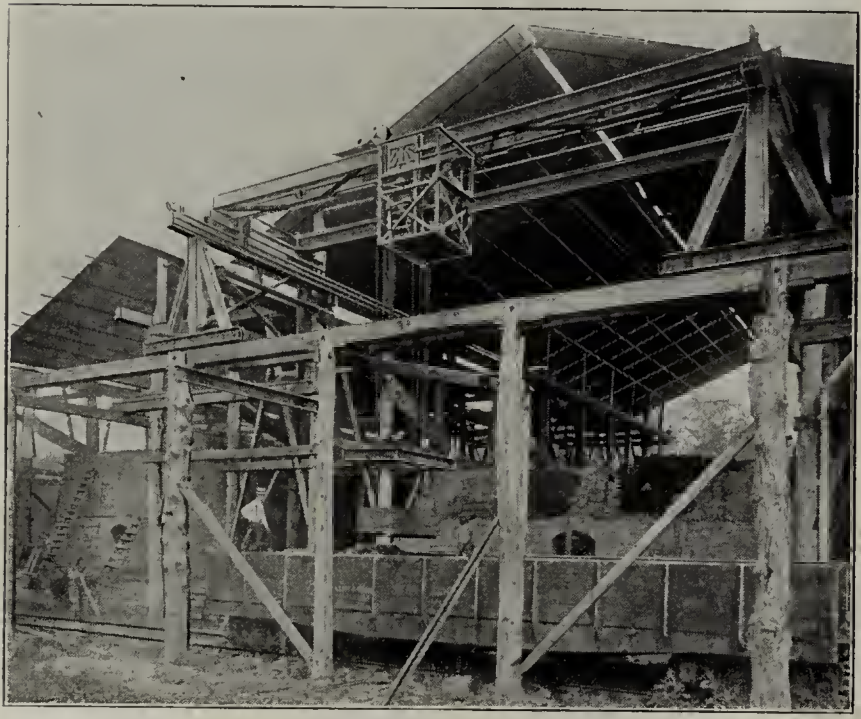
After a full exchange of views, and many heart-to-heart talks, the old plans were laid on the shelf and the following decision reached:

To make both common and repressed brick.

To use electricity and individual motors for all power purposes, open top up-draft kilns with a holding capacity of about 700,000; to burn in same kilns both common and repressed brick; to house all machinery in permanent metal-roofed buildings; radiating heat dryers, with drying trackage on roof and elevator service, transfer track between dryers and kilns, to be standard railroad gauge connected to main line, a rear loading track extended to take ten loaded cars; elevated coal pocket with incline siding to main line; permanent fuel service tracks between kilns; all trackage for loaded cars to be down grade; kilns to be equipped with overhead



Front of Kiln—Hoisting Loaded Car.



Rear of Kiln—Loading Brick Into Car.

Emptying a Kiln.

traveling cranes arranged to handle dried brick to setters, and burned brick to cars on rear loading track; firing and fuel floors between kilns to be concrete paved; the entire kiln structure to have steel-trussed, metal-covered roofs; a complete water system with fire protection; and last, but not least, provision for "systematic" extensions to dryers and kilns.

Within the scope of a magazine article the reasons for all this cannot be gone into. Many of them will be apparent to the practical brickmaker; suffice to say, they represented the combined experience of five men, each successful in his particular calling.

The following machinery equipment was also decided on:

Thew steam shovel, Dewey locomotive for clay haulage and twelve clay cars of special design, friction drum hoist, feeding granulator, disintegrator, pug mill, brick machine, two radiating heat dryers, 340 dryer cars special for crane handling, one dry pan, two represses, all for 125,000 daily capacity; stiff mud end-cut brick from the Chambers Brothers Company, Philadelphia; two electric cranes, special design, Northern Engineering Works, Detroit, Mich.; six fuel service bat and ash cars, special design; five alternating current 550-volt motors, General Electric Company.

A trip was made to the plant site, and the ground gone over carefully with a leveling instrument; permanent "bench mark" and "base line" stakes were driven, to which all drawings would refer, and from which all location measurements and grade levels must be taken.

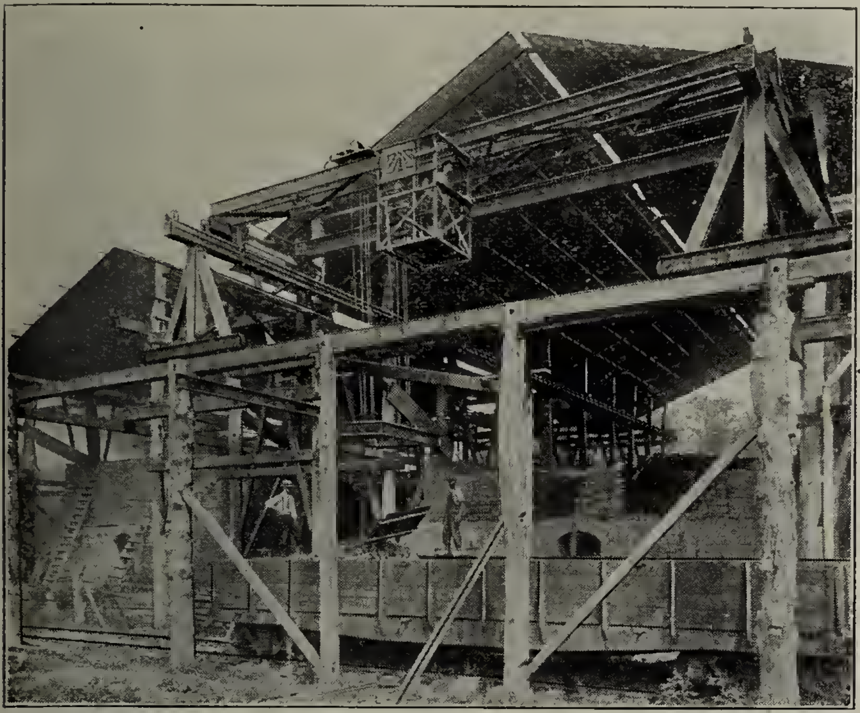
Loaded down with these instructions, a complete set of foundation and setting drawings of individual machines and motors, a roll each of drawing and tracing paper, and "carteblanche" as to plant design, Hillyer packed up his drawing board, instruments, etc., and left for his Virginia farm; there, five miles from a railriad and with no "entangling alliances," the detailed drawings of the Brickhaven plant were made and began drifting into the Raleigh office. The first one, a grade drawing, almost caused a rebellion. It called for a depressed loading track with varying grades, four transfer tracks at various levels, one long inclined dirt embankment to coal pockets, and various grades and fills, all irrespective of the actual surface conditions. Hillyer was obdurate; he was a crank on accuracy and dimensions; this was his domain; others must not intrude where "angels fear to tread," and well-matured policies and plans must be adhered to. The Raleigh contingent, however, rose to the occasion, the "steam shovel" was ordered forward, and all was quiet again along the Cape Fear.

Many construction difficulties arose and were overcome. The European war coming on after work was well under way did not help matters; however, during the depression incident thereto the entire force of the Raleigh plant was moved to Brickhaven and employed on construction work and the plant pushed to completion. As the kiln and traveling crane structure approached completion, and its purpose understood, there were many shakings of heads and dire predictions of failure by the "old-times," which finally reached its climax when the traveling cranes were unloaded and with their appurtenances scattered over half a city block. The general opinion of this treading on sacred ground was forcibly expressed by one of the old "tossers": "Well, boys, we soon have lot junk ter take down." The plant from the steam shovel to and including the dryers was pronounced a "classic," but this crane business could never make good.

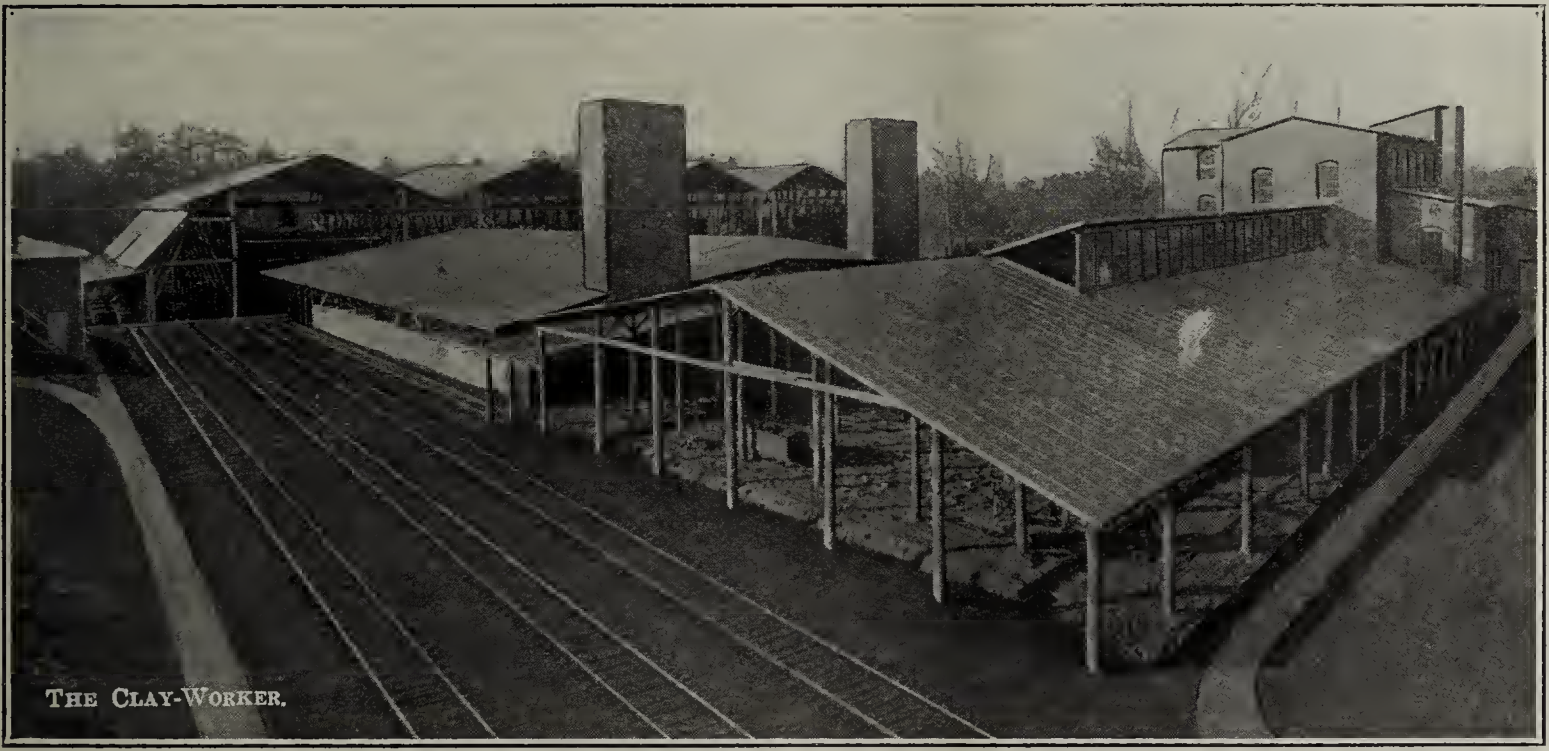
At last the plant was finished; brick machinery tested out, dryers filled with brick, cranes installed, current turned on, and a car of dried brick in position on one of the kiln stub tracks. The stage was set, an appreciative audience assembled, and it remained only to be seen whether the crane operator, without assistance from either setters or transfer men, could pick up loaded cars from the kiln stubs, place them on the turntable setting platforms and return the empty cars. The signal was given; with a musical humming and purring of motors the crane slid into position, the car lifting frame lowered into the track wing guides, and with a forward movement of the crane bridge the lifting angles were brought squarely under the axle boxes; a slight movement of the lift control, and that car and its load were whisked into the kiln and placed on the setting platform.

The daily handling of 600 tons of manufactured product is now ancient history; No. 3 transfer is a deserted spot, and silence reigns supreme. One lone man may be seen placing loads and empties, his only companionship the silent, tireless giants overhead. From sheer force of habit, Kennedy drifts around to ascertain the "how cum" of this seeming inactivity. Nothing doing, and he hurries back to finish those ten waybills for No. 2 local blowing for the siding. Soon the "coughing" of a heavy locomotive and the cursing of a train crew trying to start those cars up that heavy grade are music to his ears. It makes so much difference which way you "shove 'em." The episode of the first grade drawing is recalled with a shudder at what might have been. But, no; the crowbars and car movers are safely stowed away in the plant museum along with the wheelbarrows, gangplanks and other paraphernalia of a prehistoric age. We had made the railroad a fair proposition. You do the "shoving" and we'll operate the brakes; or, we'll operate the brakes and you do the "shoving." They, however, appreciate the "business," and general freight orders were soon sent out: "Pick up all empty gondolas and approach Brickhaven with a full head of steam." We had also saved the expense of annually lifting 90,000 tons of dirt through 9 feet and 6 inches of vertical height. "Every little helps."

The accompanying illustrations give a good idea of the crane and kiln structure. The cranes are moved from kiln to kiln by means of a raised rear transfer track and trucks; the two trucks, when coupled one each to the crane runway stringers, provide a rear extension of same over the rear loading track below, but with the crane in position and securely fastened to the trucks, and the runway connections removed, the combined crane and trucks are transformed into a gigantic car, with the crane bridge as the body, which can be moved at will.



Dumping Brick Into Freight Car.



General View of Plant of Cherokee Brick Co., Raleigh, N. C.

Crane service will be appreciated from the following:

Some months ago, with only three kilns equipped and business dull, rush orders were received for 117 carloads to the Powder Company at Hopewell, Va., and a big job in the western part of the state, where brick from another concern had been turned down. No. 1 kiln was cooling off; No. 2 kiln had just been filled; No. 3 kiln was half empty; the crane loafing on the job. That loading-out crane on No. 3 got busy and cleaned up the back of the kiln, dropped the setting platforms in place and began the double duty of serving the setters with dried brick over the front end of kiln, and loading brick on cars on rear siding. Orders were given the railroad to keep the Brickhaven siding filled with empties. The other crane was moved to No. 1 kiln and rigged with electric lights for night work, and as one of the loaders put it. "We jus natully eat dat kill up."

Again, the "bat" is a product of the ancient wheelbarrow and several handlings by common labor trying to make time and money under adverse conditions. Crane service with a single handling has reduced the "breakage" 90 per cent.

Coal Bin and Transfer Car.

The writer hopes the story as told with bits of character portrayal will be interesting, and to one who reads between the lines instructive, and can well conclude with a characteristic summing up of the whole by one William Perkinson, a negro hand of the old school, better known as "Ole Bill." Bill had been with the Johnsons for years, and was the guiding spirit at the steering wheel and transmission of a mule and cart. He was wise to the brickyard game, and could give most of them cards and spades and "jus natully beet 'um haulin' cole bats 'en ashes roun' de kill." Sent to Brickhaven during the construction period, he was upon completion of the plant ordered home, and reported to the Raleigh office.

"Well, Bill, you got back, I see."

"Yes, suh; I dont bring mah mule home—dat am no fit place fer no mule nohow—sumfin right at yer er on top you all time. Yuh un'stans dose tricks dey's got runnin' roun' dose kilns just natully jump out en grabs thengs. Dey ketches up car brick fer dose setters, jus han's to 'em. Dose setters used to wurk en swet, but dey doan do nuffin no moah; jus picks 'em up an' lays 'em down. Dey too lazy to reach fer a brick; jus turns dat car roun' en picks 'em off tother en'. Dey plum spoil areddy. Yuh got keep yuh eye skin all time. I sets right much stoah by mah mule, en we done 'scape so fer. Roun' back dose kilns yuh see nigger sittin' on cole cahr. One dose crames bust out with 'er thousand brick. Dat nigger wake up, push suffin, en dose brick jus natully slide down in dat cahr. Wurk! Dat ain no wurk! I use to wurk, hauling cole, ashes en bats roun' de ole plant. I doan zacly uner'stan 'bout dem bats. Dey doan seem be much bats no moah. En cole—ashes! One dose injines jus push car cole on dat pocket; John, he knock out de bottom, shove de little cahr to dat tunnel, en load up fore yuh turn roun'; den he take dat cahr whar he please. When he done dump it between dose kiln, dose buhners jes fill 'um up wid ashes, en afer he dump 'em en came back on dat transfer he doan look out dat crab, pick de cahr up en load it wid trash. Yuh knows dat ain no place fer no mule, er no cahrt. I done cric mah neck lookin' out fer me an mah mule—ain much place for no mens. I spec we all lose our job." (Applause.)

President Deckman: You have already asked Mr. Johnson a great many questions, but if there are any further questions you desire to ask, I trust you will do so now. The secretary will announce the next order of business.

Secretary Randall: It has been suggested by a number of the members that we are moving along in such good shape this morning that we continue in session until we have finished our entire program. We can do this without any trouble if the members will lend their assistance. The next number on the program is an illustrated paper by Mr. Homer F. Staley, of Ames, Iowa, on "The Use of Clay Products for Farm Buildings." While Mr. Staley is arranging his lantern slides I would say that we have received notice since the convention assembled of the death of two of our old-time members, Mr. Ben. F. Walcott, of Indianapolis, who though he had been a member for many, many years, had not on account of defective hearing attended any of the conventions, died Sunday morning. Every one who knew him loved him. The other member is Mr. C. D. B. Howell, of Chicago, another old member of the association, who had not attended the conventions for a number of years. He has been associated of late years with the Purington Paving Brick Company. We also have a telegram from Mr. G. C. Wheat, who was called home unexpectedly by the illness of his little son, that the child has tubercular meningitis and there is little hope for his recovery. We also have a telegram containing good news, which you will be glad to hear. Fritz Salem wires as follows:

Homer F. Staley, Ames, Ia.

Slidell, La., 11:45 A. M., February 24.

T. A. Randall, Hotel Statler, Cleveland, Ohio.

Your telegram received. I appreciate very much the sentiment conveyed. Please express my regrets to my friends at not being able to be with them, and my sincere appreciation of the high honor conferred upon me by them. I am feeling much better and expect to be in good shape again in a few weeks. My kindest regards to all. Fritz Salmen.

THE USE OF CLAY PRODUCTS FOR FARM BUILDINGS.

BY PROF. HOMER F. STALEY, CERAMIC DEPT., IOWA STATE COLLEGE.

Mr. President and Gentlemen of the Convention:

Clay products have been used for farm buildings more extensively in Iowa than in any other state. However, the manufacturers of clay products in Iowa feel that they have made only a beginning and that a vast market for clay products building materials lies ready for development on the farms of the state. Forty million dollars a year, over $100,000 a day, are spent for farm buildings in Iowa alone. A large proportion of this amount is spent for walls and foundations, for which purposes clay products are ideal materials.

While the possible market for clay products on the farms of this one state alone run into surprisingly large amounts and there is no doubt that clay products **should be used** in place of some substitute, there is nothing in these statements about which to get excited. The possible market for clay products has always been enormous, many times the actual market. The really remarkable thing in the situation in Iowa is that the manufacturers of clay products are confident that clay products **will be used** to supply this market. In other words, they feel that they have the solution of the old, old puzzle of how to make the actual market for clay products approximate in size the possible market. This paper is presented in the belief that the solution of this problem is of vital interest to every clay products manufacturer in the country.

If we were to formulate into a slogan the central idea of the Iowa clay products manufacturers' campaign to sell building materials to farmers, it would be somewhat as follows: **"To sell a high quality product at a competitive price."**

There are three distinct ideas in this slogan—(1) to sell, (2) a high quality product, (3) at a competitive price. The ordinary scheme for selling clay products in competition which substitutes such as wood and cement is based on only one of these three, namely, "a high quality product." The clay product manufacturer is certain that his material is of higher quality than the competing material, and that therefore it practically should sell itself at a higher price than that at which the competing material is sold. To paraphrase the famous words of Lincoln, if you sell on quality alone you can sell to a few of the people all of the time, you can sell to some of the people some of the time, but you cannot sell to all the people all of the time. But, if you are prepared "to sell a high quality product at a competitive price," you can sell to all of the people all of the time.

The key to the situation that we believe is going to result in the general use of clay products for farm buildings in Iowa lies in the history of the hollow tile silo in that state. When silos first began to be built in Iowa, the clay products manufacturers were certain that an 8 to 12-inch wall built of brick or hollow tile would make a better silo than one built from any other material. Therefore, they waited for the farmers to come around and buy clay products for silo walls at a price considerably higher than that asked for the same amount of wall built of wood or cement. Only a very few farmers came around. The great majority of earlier silos were built of wood or cement.

The agricultural engineering section of the Agricultural Experiment Station of Iowa State College was deeply interested in silo construction and was convinced that hollow tile would make a very good silo, but that if the hollow tile silo was ever to become popular it would have to be reduced in price. Mr. M. L. King, who was then on the staff of the Agricultural Engineering Station, devised a hollow tile silo built with 4-inch walls, reinforced with steel wire. The blocks were made very cheaply on an ordinary hollow tile machine, but curved by using curved pallets on the cutting table and pressing the clay column down on these pallets by means of a cloth-covered wooden roller. This silo was christened the "Iowa Silo." This silo and the methods used in construction are described in detail in Bulletin No. 141 of the Agricultural Engineering Station of Iowa State College. This bulletin will be sent free to all who apply for it. This silo solved the question of a "competitive price," for such a silo could be built at a price comparing very favorably with that asked for a good wood silo.

Strange as it may seem, this thin-walled silo was strenuously opposed by the clay products manufacturers, in general, of the state. They felt they would not be able to sell a large enough bill of goods when they sold a silo. I am informed that for two years after this silo was designed there was only one manufacturer of clay products in the state who could be induced to make the blocks for it. He did a rushing business, and the others fell into line. When these manufacturers found that, although they were making a smaller profit per silo, they were selling ten times as many silos as they could have ever hoped to sell of the more expensive thick-walled type, they saw a great light.

There are over 6,000 thin-walled clay block silos in Iowa at the present time, and practically all the silos being built are of this type. There are 15,000 wood silos in Iowa, nearly all of which will be replaced by tile silos during the next ten years. The invention of the thin-walled hollow tile silo has given the clay products manufacturers practically a corner on the market, for it was the first step in enabling them "to sell a high quality product at a competitive price."

The thin-walled tile silo has not proven popular with manufacturers of clay products in other states. The tendency among manufacturers has been to stick to heavier walls and more intricate and higher priced tile. The consequence has been that clay products silos have been expensive in these states and the number sold lamentably small. A hollow tile silo can be built almost anywhere in Iowa for $2.95 a ton storage space. According to figures collected at the short course for farmers held at Ohio State University this winter, the average price for clay products silos in Ohio is $4.25 per ton storage space. For concrete silos the average price is $4.20. In Ohio a clay products silo is considered a luxury for the "gentleman farmer;" in Iowa, it is considered the best investment for the man making his living on his farm.

Having "a high quality product at a competitive price," the attention of the clay products manufacturers of Iowa was next turned to the ideas involved in the little verb "to sell." They awoke to the fact that in order really **to sell** clay products they would have to do more than stick a sign "office" on a little shack back of a rather disreputable looking plant out on the edge of town. You couldn't sell Ford automobiles that way. In the first place, they hired a few salesmen—real salesmen who could talk. But much more important than this, they incorporated into their merchandising plan some ideas of what is known as "service" to their customers. They set about making it easy for the farmer to use clay products. First, they furnished, free of charge, complete plans and specifications for clay products silos. Next, they encouraged, by financial aid and otherwise, masons to enter the field of masonry contracting, so that they were able to recommend a reliable contractor to anyone wishing to put up a clay products building. Third, on discovering that it was inconvenient for the farmer to secure the wire, reinforcing rods, doors and other accessories needed in building a clay products silo, they put in stocks of these materials and offered to sell the farmer all the material needed to build a silo complete. They became clay products "merchants" in the modern sense of the term.

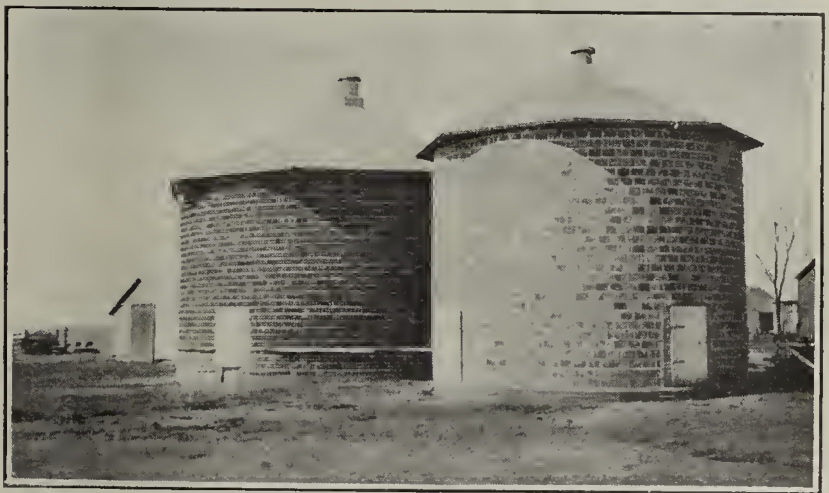
Hollow Tile Smokehouse.

Forty-four-Foot Round Hog House, Five-Inch Walls.

In any masonry construction it is, of course, very important to have a scaffold that is convenient, safe and economical. For building silos such a scaffold was devised by the Agricultural Experiment Station of Iowa State College, working in conjunction with silo builders. It consists of a circular platform suspended on the inside of the silo from four posts by block and tackles. As the building of the silo progresses, the supporting posts are lengthened and the platform is drawn up to a convenient height for the workmen. These platforms are portable and are carried from job to job by the masonry contractor, so there is no large charge for scaffolding to be made against any one silo. This scaffold is also described fully in Bulletin No. 141 of the Agricultural Experiment Station.

Having learned from their experience with silos how to sell clay products to farmers for one type of structure, the clay products manufacturers of the state were eager to apply the same method to the sale of clay products for other types of farm buildings. In this they have been aided very materially by designs put out by the Agricultural Experiment Station. Of course, it must be understood that the station is not interested in the sale of clay products. The station is interested in helping the farmers of the state secure the most satisfactory and economical farm buildings that can be devised. In such an effort the use of clay products of good quality and low price must play an important part. The station has published plans for farm buildings calling for all kinds of building materials, wood, cement and clay products. In justice to the farmers of the state, the station has had to recommend clay products for many uses. With clay products manufacturers of the state keenly aware of their opportunities and possessed of the knowledge of how to sell clay products to farmers, the result has been that these products have been used very extensively for various types of farm buildings. In this work, the manufacturers have not depended wholly on the college to develop new uses for their materials, but have been very active themselves in designing new types of structures involving the use of clay products.

Iowa Type Hog House, Showing Method of Ventilation.



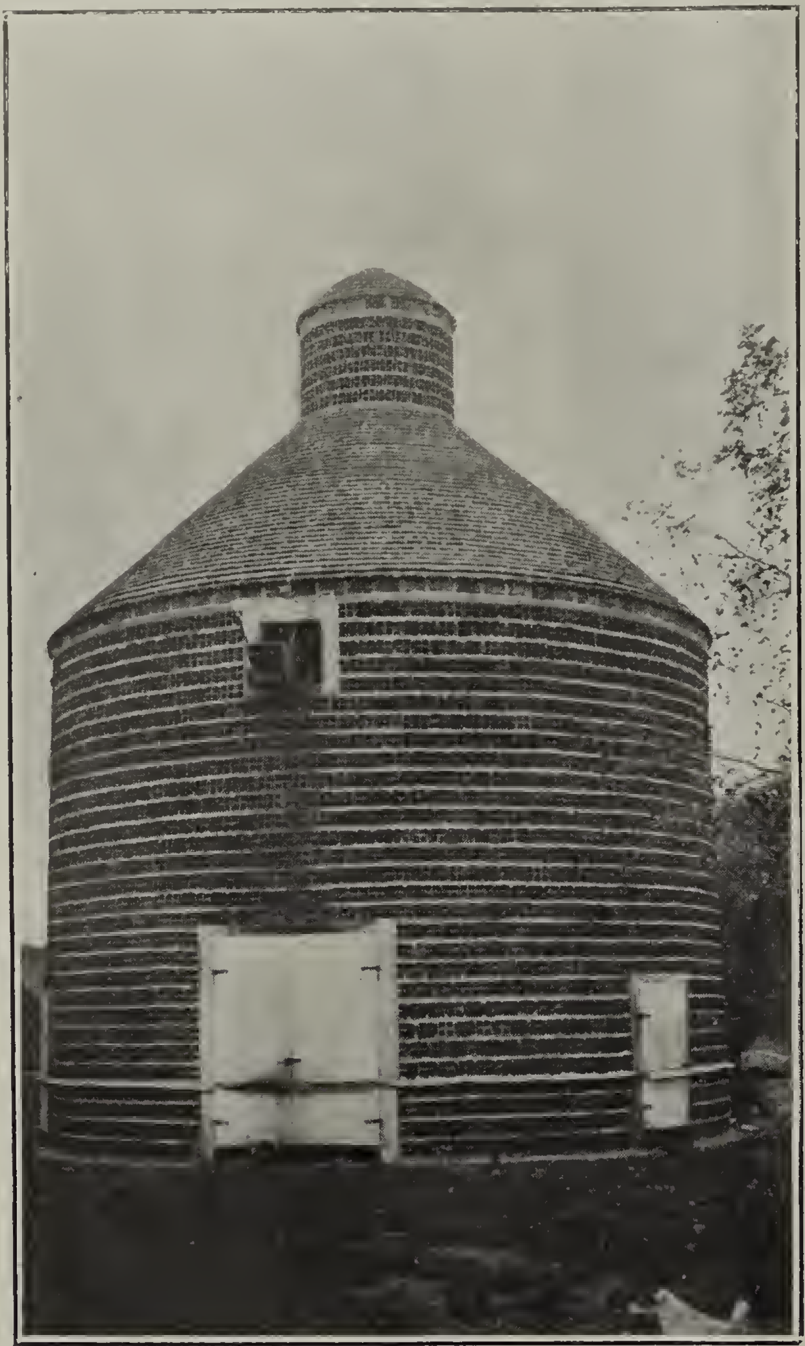
Twin Corn Crib and Granary.

Of course, the use of clay products, especially hollow tile, for barns has been an important question. Hollow tile have been used very largely for the basement or first story walls of all sorts of barns. Some rectangular barns have been built with the walls built entirely of hollow tile. The most popular type of barn involving the use of clay products is the circular barn built with hollow tile walls. One reason for this popularity lies in the economy of wall material. A 40x60-foot barn will have 200 feet of wall, and, neglecting the ground covered by the wall, a floor area of 2,400 square feet. A 50x50-foot barn will have the same amount of wall and a floor area of 2,500 square feet. A circular barn 63.6 feet in diameter will also have 200 feet of wall and a floor space of 3,180 square feet. In other words, by building a circular barn instead of a rectangular one, the farmer gets 32.5 per cent. more barn with the same expense for walls.

Some of these barns are quite large. The largest built up to the present time has a diameter of 122 feet. This is equal in size to a barn 40x293 feet. But if the farmer had built a rectangular barn 40 feet wide, using the same amount of wall material, he would have had a structure only 40x151.5 feet. In this case he got

93 per cent. more barn for a given amount of wall by using the circular type of structure.

Hollow tile hog houses are very popular in Iowa. They have the advantages of being permanent, warm in winter and cool in summer. They make it possible for the farmer to raise young pigs the year around. Formerly the half-monitor type was very popular, but at present the "Iowa Sunlit," designed by the Agricultural Experiment Station, is being built in large numbers. This is a low rectangular building with an A roof. Light is introduced by two series of skylights extending the length of the roof.



10,000-Bushel Corn Crib with Self-Supporting Tile Roof.

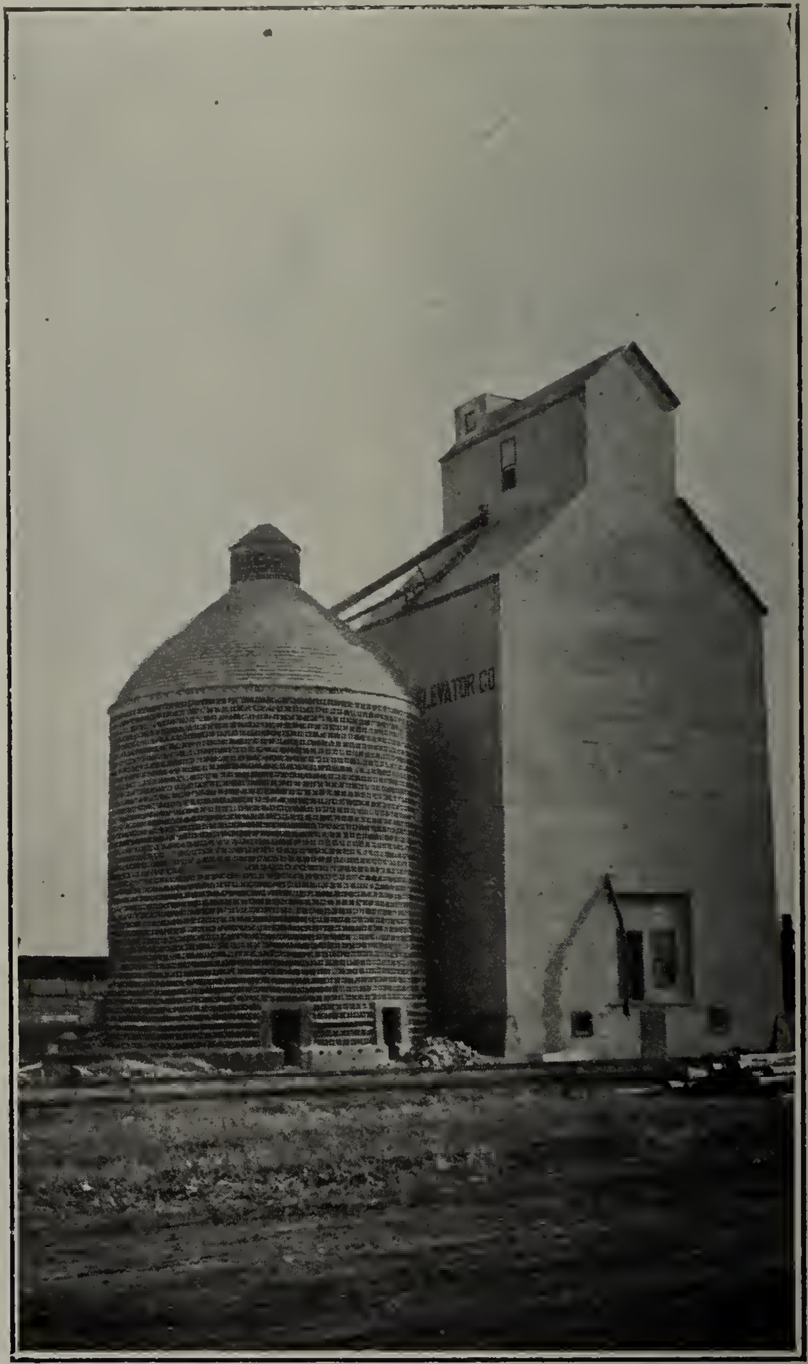
Chicken houses are being built of hollow tile in large numbers. Up to the present time the shed roof type has been most popular. This will probably be replaced in popular favor by a new design very recently brought forth by the Agricultural Experiment Station. This chicken house is equipped with skylights and is very similar in construction to the "Iowa Sunlit" hog house.

In a great corn and grain producing state, corncribs and granaries are important buildings. The average sized corncrib on a farm holds 10,000 bushels. The granaries hold 8,000 bushels. Several years ago an enterprising clay products manufacturer recognized the possibility of developing a demand for a first-class clay products corncrib and patented a self-ventilating, circular, hollow tile corncrib, equipped with a self-supporting tile roof. These have been built in large numbers. Other types of tile corncribs are now on the market, but have not been built in such large numbers as the circular type. Many granaries have been built of hollow tile, generally in the circular type of construction.

A great variety of other small farm buildings are being built of hollow tile. These include ice houses, wagon sheds, workshops, milkhouses, smokehouses, garages, cattle sheds, water tanks, etc. Almost every week we hear of some new use to which hollow tile are being put on the farms of the state. One very interesting and encouraging feature in connection with these smaller structures is that the farmers themselves are putting up the buildings. They are being encouraged to do this by both the clay products manufacturers and by the college. "Every farmer his own mason" is a popular slogan in Iowa.

Clay products are being used more and more extensively for farm homes. In many instances brick have been used. Hollow tile coated with cement stucco are quite popular. A few factories in the state are putting out rough-faced hollow tile that are intended to be used without stucco. These are meeting a good reception, and it is believed that the use of clay products for farm homes will develop extensively along this line.

Not content with their individual efforts to push the sale of clay products building materials, a large group of the more progressive manufacturers of the state have formed a publicity organization known as the Permanent Buildings Society. Mr. M. L. King, "the father of the Iowa silo," is secretary of this organization and devotes his entire time to promoting the use of clay products for farm buildings. He travels from one end of the state to the other lecturing and giving demonstrations at state fairs, county fairs, farmers' institutes, village chautauquas, etc. During the rare intervals, in which he does not have a speaking date, he devotes his time to developing the use of clay products in new ways and new types of clay products to meet the requirements of various kinds of structures. It is the belief of the men back of the Permanent Buildings Society that a type of clay product and method of construction can be devised that will enable them "to sell a higher quality product at a competitive price" for every type of building construction, and they intend to do it.



10,000-Bushel Corn Crib, 30 Feet in Diameter.

As stated above, the methods of construction used in building the Iowa silo are given in full in Bulletin No. 141 of the Agricultural Experiment Station of the Iowa State College, Ames, Iowa. This bulletin can be secured free of charge by sending a request to the station. Working plans in blue print form of a large variety of structures calling for the use of clay products are put out by the college. A list of these and directions for obtaining them are given below.

Available Farm Building Plans.

The building plans here listed have been worked out in response to a great demand for better farm buildings. They are the result of a number of years' work on the part of the agricultural engineering section of the Iowa Agricultural Experiment Station in co-operation with the farmers of the state. It is the intention to publish the best of these plans in bulletin form at some future date; but, for the benefit of those who want them at once, they may be had now in the form of blue prints.

To insure that these plans will go only to those who will make use of them, a charge of 5 cents per blue print sheet is made to cover the cost of blue printing. To determine the cost in cents of any one plan, multiply the number of sheets by five.

This list is not complete. If it does not contain what you want, write us about it. New plans are being added constantly. Plans will be furnished as promptly as possible, but a few days should be allowed for the making of the blue prints.

In order to avoid mistakes, please order by number. Be sure to write your name and address plainly. Address the Agricultural Extension Department, Agricultural Engineering Section, Ames, Iowa.

General Barn.

No. D-157—Seven sheets, 352-358, 35c. Size, 66x35½ feet. Capacity, 18 cows, 8 horses. Two pens, silo, wing joist framing, clay block walls, grain storage on second floor. Gambrel roof.

Silo.

No. D-9—Two sheets, 23-24, 10c. Size, Iowa silo 16x36 feet, water tank 11.6x16 feet. Four-foot hollow clay block wall, reinforced concrete roof and door frame.

Hollow Tile Silo Surmounted by Wind Mill.

Silo Scaffold.

No. C-60—One sheet, 145, 5c. Scaffold for building Iowa silo.

Water Tanks—Storage.

No. D-148—One sheet, 329, 5c. Size, 10 feet diameter, 12 feet high, wall 4 inches. Hollow clay blocks.

No. C-51—Three sheets, 130-132, 15c. Size, 26x14 feet. Capacity, tank 7 feet radius, elevated 26 feet, room below 12 feet high. Concrete roof, hollow clay blocks.

Hoghouses.

No. D-163—Three sheets, 367-369 ("Iowa Sunlit"), 15c. Size, 25x60 feet. Capacity, 20 pens 6x8 feet. Eight-foot drive, continuous skylight, clay block construction; to be set north and south.

No. D-151—Two sheets, 332-333, 10c. Combination hoghouse and corncrib. Capacity, 12 pens 6x8 feet, 800 bushels of corn. Storage, feed room, feeding floor, bedding storage, hollow clay block walls.

No. D-156—Four sheets, 348-351, 20c. Size, 44x22 feet. Capacity, 12 pens 6x8 feet. Feed mixing room, 4-foot clay block walls, continuous skylight over hog house.

No. D-160—Four sheets, 361-364, 20c. Size, 12x90 feet, storage 16x18 feet. Capacity, 15 pens 6x8 feet. Feed bins, straw storage, 5-foot clay block walls, reinforced concrete door frames, single row of pens, south front.

No. D-235—Five sheets, 538-542, 25c. Size, circular, 50 feet diameter. Capacity, 26 pens. Corncrib in center.

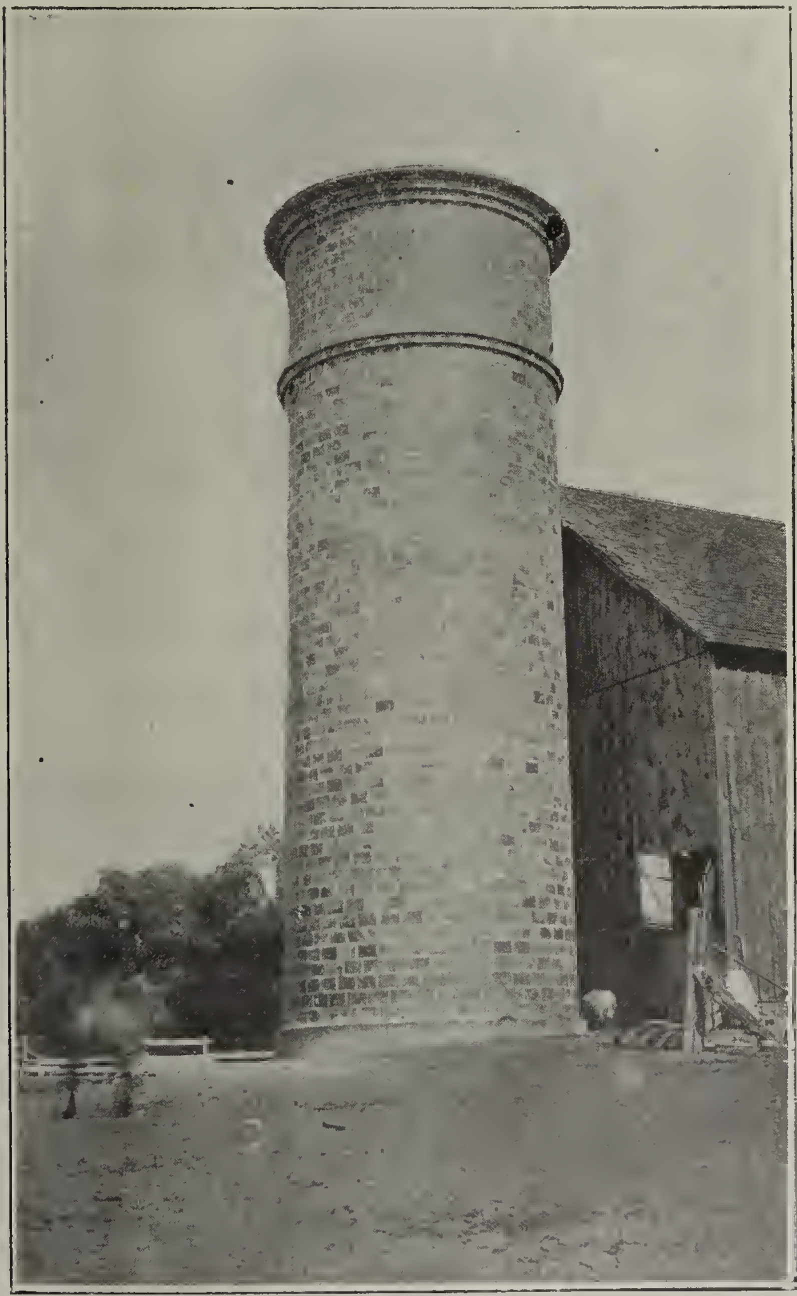
Corncrib.

No. D-184—Four sheets, 406-409, 20c. Size, 32x30x16 feet studding, cribs 10x32x20 feet. Capacity, 4,000 bushels of corn. Two bins over driveway; size, 10x10x14 feet; capacity, 2,000 bushels of grain. Stationary elevator with pit, cupola, chute for delivery of grain, hopper, engine and grinder above driveway. Walls of diagonal-cut clay tile corncrib blocks.

Poultry Houses.

No. C-27—Three sheets, 68-70, 15c. Size, 12x16 feet. Capacity, 50 hens. Brooding coop, roosts, dropping boards, dust box, clay block walls, shed roof, windows and curtains in front.

No. D-158—One sheet, 359, 5c. Size, 20x12 feet. Clay block walls, shed roof, dust box, nests, roosts, curtained front.



14x50-Foot Silo with 5-Inch Walls, in Use Six Years.

No. C-201—Four sheets, 454-457, 20c. Skylight poultry house, hollow clay block walls, open south front.

Smokehouse.

No. C-54—One sheet, 137, 5c. Four-foot hollow clay block walls, reinforced concrete roof and curing vat, fireplace.

Milkhouse.

No. D-232—One sheet, 530, 5c. Size, 13x17x5 feet. Hollow clay blocks.

Milkhouse and Icehouse.

No. D-165—One sheet, 391, 5c. Size, icehouse 15x15x15 feet high, milkhouse 15x10 feet. Double wall of hollow clay blocks, cement coat on inside; ceiled overhead and space between rafters filled with insulation; reinforced concrete cooling room; door frame; cooling tank.

No. C-214—Three sheets, 491-493, 15c. Size, same as above. Hollow clay blocks.

Icehouse.

No. D-161—One sheet, 365, 5c. Size, 15x15x12 feet high. Double wall of hollow clay blocks, cement coat on inside; ceiled overhead and space between rafters filled with insulating material; concrete floor and door frame; drain.

Sheds.

No. C-180—One sheet, 396, 5c. Size, 40x40 feet. Eight-foot clay block wall on two sides and half way on other two sides; gable roof.

No. D-25—One sheet, 66, 5c. Size, 10x20 feet. Clay block walls, loft for bedding, open room.

No. D-173—Two sheets, 388-389, 10c. Size, 73x23 feet, shop 18x23 feet, sheds 55x23 feet. Eight-foot clay block walls on three sides; sliding doors in front.

Garage.

No. C-211—Two sheets, 486-487, 10c. Size, 28x52 2/3 feet. Cattle shed. Hollow clay block walls.

Ben H. Richards, Edwardsville, Ill.

No. D-213—Two sheets, 489-490, 10c. Size, garage 27½x18 feet, shed 44 1/3x27¾ feet. Machine shed and garage. Hollow clay blocks.

No. D-224—One sheet, 514, 5c. Size, garage 20x22 feet. Hollow clay blocks.

Farmhouses.

No. D-155—Four sheets, 344-347, 20c. Size, 30x26 1/3 feet, porch 8x21¾ feet, dining room 14x13 feet, kitchen 10x12 feet, living room 13x15 feet, three bedrooms, bathroom, sleeping porch. Eight-foot clay block walls, stucco finish.

No. C-189—Eight sheets, 425-432, 40c. Size, 30 2/3x33 2/3 feet. Eight rooms, hall and bath, washroom, porch, fireplace; brick walls.

No. C-192—One sheet, 438, 5c. Six-room cottage, clay block walls, arched tile roof.

No. C-193—One sheet, 439, 5c. Five-room cottage, clay block walls, arched tile roof.

President Deckman: I take it from the interest manifested and the number of inquiries made during the presentation of Mr. Staley's paper that this subject requires no further discussion. In conformity with the suggestion made by Mr. Randall, unless there are objections we will stay in session until we have finished our program. Mr. Secretary, what is the next number for consideration?

Secretary Randall: The next is an illustrated paper entitled "Old Versus New Methods of Trucking Brick," by Mr. Lemon Parker, of St. Louis, one of the ex-presidents of the association. Mr. Parker is not able to be with us, however, he has sent us a paper together with some illustrations. Mr. B. H. Richards, who is to discuss Mr. Parkers' paper, has gone over same and so is prepared to take up this subject. I have a letter from Mr. Parker expressing regret that he could not attend the convention.

OLD VERSUS NEW METHODS OF TRUCKING BRICK.

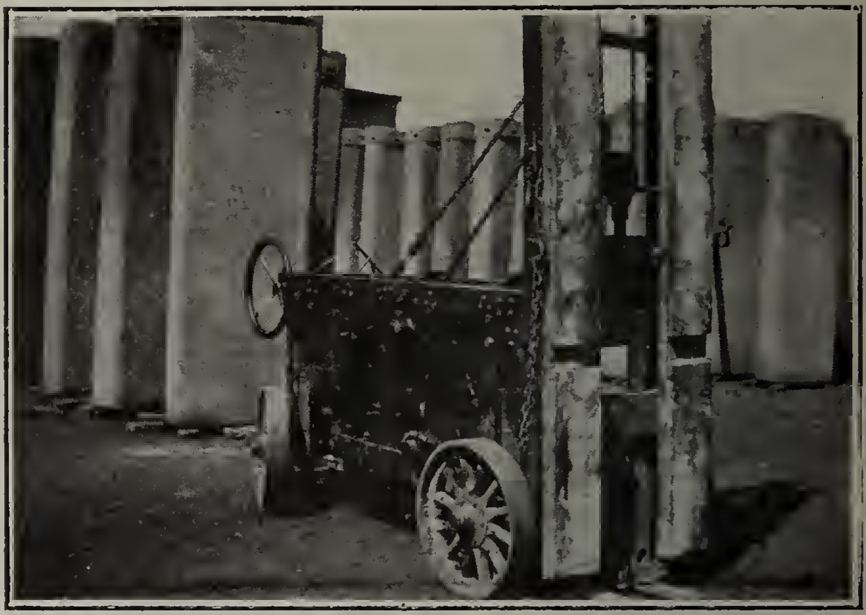
BY LEMON PARKER, ST. LOUIS, MO.

Mr. President and Members of National Brick Manufacturers' Association:

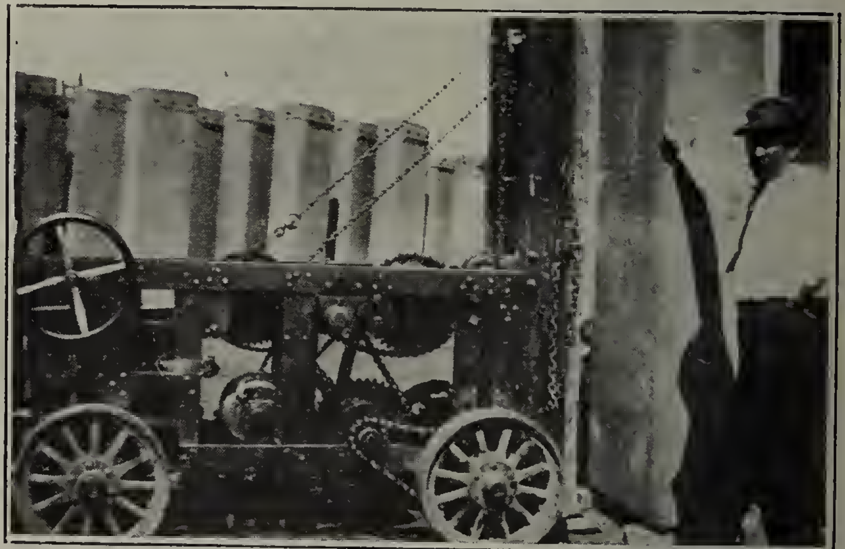
I have been asked for data on handling clay products on a plant with electric warehouse trucks.

There certainly is a large saving where the distance material is handled is over 200 feet.

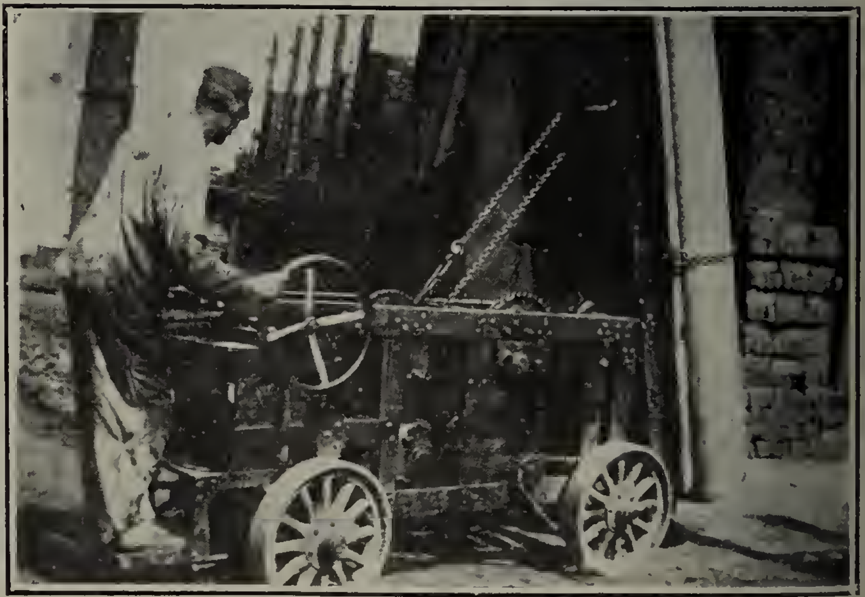
In Table No. 1 the costs of setting and emptying our kilns by



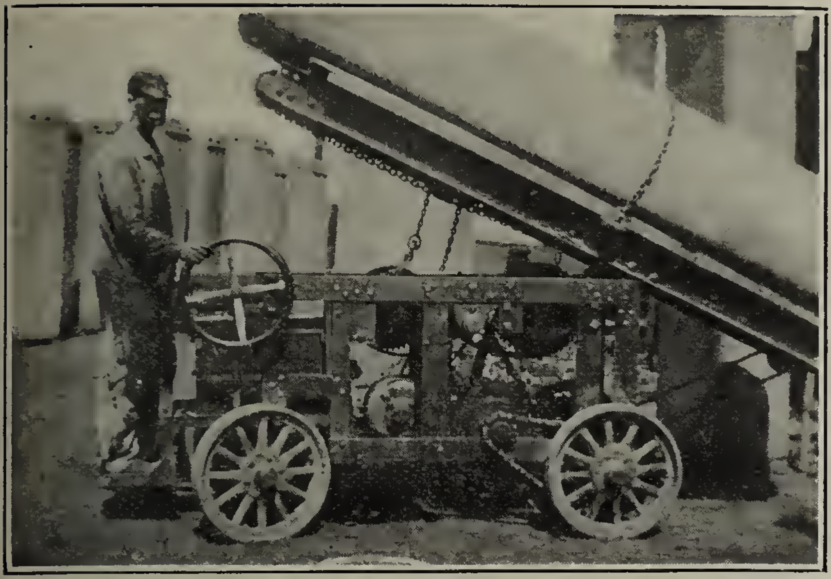
Motor Truck for Carrying Gas Retorts.



Truck Picking Up Gas Retort.



On the Way with a Gas Retort.



Truck About to Deposit Gas Retort.

Truck Separated from Trailer.

wheelbarrow is given for a period of ten years. The material handled is a varied product, consisting of brick, fireproofing, tile, retorts and settings.

TABLE No. 1.

Herewith find results of tests of electric trucks: Table of setting and emptying kilns.

Costs for:	Per ton.	One-half cost per ton.
1902	$ .562	$ .281
1903	.583	.291
1904	.551	.275
1905	.490	.245
1906	.520	.260
1907	.560	.280
1908	.404	.203
1909	.452	.226
1910	.485	.242
1911	.475	.237
	$5.082	$2.540

Average cost for ten years, $ .5082, setting and emptying.

For emptying, $ .2541.

Table No. 2 shows material emptied from kiln No. 15 during one hour and forty minutes, together with distance with the barrow, and later in afternoon, same day, a run of two hours with an electric truck.

TABLE No. 2.

Data of electric truck against wheelbarrows. December 23, 1912. Barrows, 501-foot delivery. Emptying kiln No. 15, 10:20 a. m. to 12 m., 1 hour 40 minutes.

—Wheelbarrows—

255—1 S 5	3,825	13 loads @ 426 ft. each	5,538 ft.
160—3 R 8	1,760	6 loads @ 372 ft. each	2,232 ft.
72—2½x12x20	2,952	10 loads @ 610 ft. each	6,100 ft.
31—2½x12x18	1,178	4 loads @ 610 ft. each	2,440 ft.
84—3¼x15½x24½	7,224	28 loads @ 475 ft. each	13,300 ft.
70—2x12x15	2,170	5 loads @ 690 ft. each	3,450 ft.
	19,109 lbs., or 9.5545 tons.	Average No. ft. each load, 501.	33,060 ft.

2 men @ 21c per hr.
6 men @ 17½c per hr.
Total cost, $2.45.

Average cost per ton, $ .256. Double this for setting and emptying, $ .512.

—Electric Truck—

2:40 p. m. to 4:40 p. m.—2 hours. Electric truck, 557 feet delivery.

118—2x12x15	3,658	1 load @ 690 ft. each	690 ft.
49—3¼x15½x24½	4,214	2 loads @ 475 ft. each	950 ft.
100—2½x12x30	6,300	3 loads @ 630 ft. each	1,980 ft.
600—No. sq. bk.	4,200	2 loads @ 420 ft. each	840 ft.
	18,372 lbs. or 9.186 tons.	Average No. ft. each load, 557.	4,460 ft.

3 men @ 17½c per hr.

1 man @ 21c per hr.

Total cost, $1.47.

Average cost per ton, $ .16. Double this for setting and emptying, $ .32.

Data on performance of electric truck, December 21, 1912, with and without wicket.

Truck hauling 483½ feet, against barrows 285 feet.

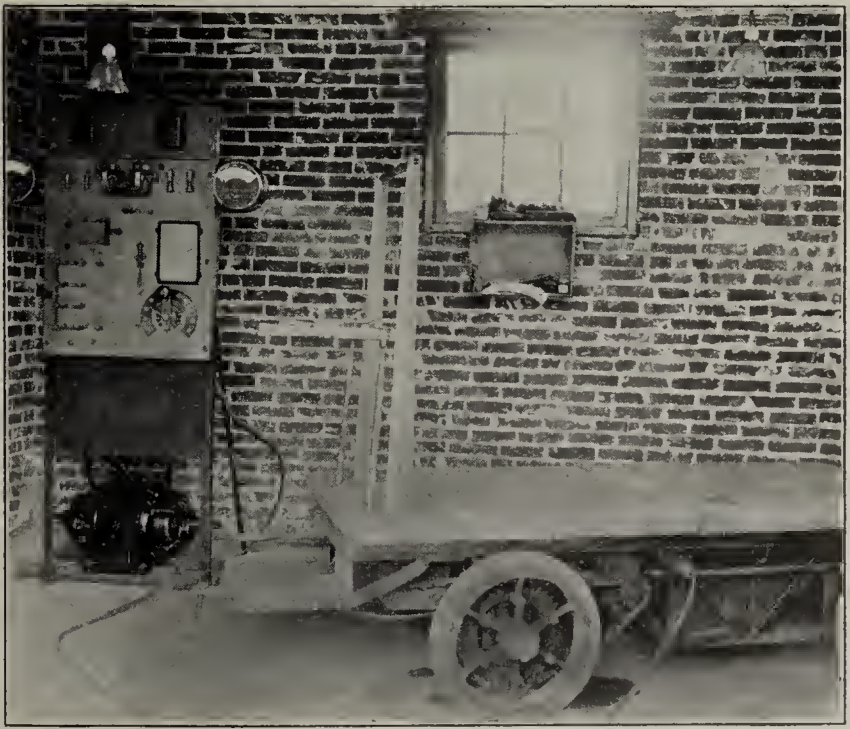
—Truck—

9:10 a. m. to 12 m; 12:30 to 4:40 p. m.—7 hrs. and 7½ hrs.

(Emptying Kiln No. 9.)

79—Carbon tile	1,461	1 load @ 327 ft. each	327 ft.
12—2 A 7	732		
7—2 A 6	658	1 load @ 636 ft. each	636 ft.
351—90 L	30,186	16 loads @ 636 ft. each	10,176 ft.
212—91	15,688	8 loads @ 387 ft. each	3,096 ft.
130—3 F	10,400	5 loads @ 480 ft. each	2,400 ft.
386—2-in. bk.	2,123	1 load @ 384 ft. each	384 ft.
1,500—No. 1 sq. bk.	10,500	5 loads @ 250 ft. each	1,250 ft.
1,800—No. 1 sq. bk.	12,600	6 loads @ 420 ft. each	2,520 ft.
	84,348 lbs., 43 loads. or 42.174 tons.		20,789 ft.

Loading Brick in Cars with Electric Truck.



Charging Storage Battery Electric Truck.

Average number ft. each load, 483½.

7 hrs—
1 man—21c per hr.
3 men—17½c per hr.
Total cost, $5.14.
Average cost per ton, $ .121.

7½ hrs. This includes the handling of wicket—
1 man—21c per hr.
3 men—17½c per hr.
Total cost, $5.51.
Average cost per ton, $ .130.

—Barrows—Emptying Only—

Time, 3 hrs. and 3½ hrs.

195—No. 91	14,430	49 loads @ 387 ft. each	18,963 ft.
664—2-in. bk.	3,652	13 loads @ 384 ft. each	4,992 ft.
7,100—No. 1 sq. bk.	49,700	177 loads @ 250 ft. each	44,250 ft.
40—No. 1 sq. bk.	280	1 load @ 420 ft. each	420 ft.
	68,062 lbs., 240 loads or 34.031 tons.		68,652 ft.

Average number ft. each load, 285.

3 hrs.—
2 men—21c per hr.
6 men—17½c per hr.
Total cost—$4.41.
Average cost per ton—$ .129.

3½ hrs. This includes the handling of wicket—
6 men—17½c per hr.
2 men—12½c per hr.
Total cost, $5.14.
Average cost per ton, $ .151.

Note—On above basis, the saving for 24,000 tons would be $246.00 per year, delivering 483 ft. against 285 ft., barrows.

Data on performance of electric truck, December 23, 1912, against barrows. 478 feet for truck and 420 ft. for barrows.

Loaded Truck and Trailer.

Emptying Kiln No. 15—10:10 a. m. to 12 m.—1 hr. 50 min.

—Truck—

154—90 L.	13,244	6½ loads at 411 ft. each	2,671 ft
57—4x12½x15	2,964	1½ loads at 620 ft. cach	930 ft.
33—2½x12x30	2,079	1 loads at 702 ft. each	702 ft.
	18,287 lbs., 9 loads or 9.1435 tons.		4303 ft.

Average number of ft. each load—478.
1 man—21c per hr.
3 men—17½c per hr.
Total cost, $1.34.
Average cost per ton, $ .146.

—Barrows—

2:40 p. m. to 3:25 p. m.—45 min.
800 No. 1 sq. bk., 5,600 lbs., or 2.8 tons; 420 ft.
2 men—21c per hr.
6 men—17½c per hr.
Total cost, $ .55.
Average cost per ton—$ .197.

With delivery of 478 ft. for truck against 420 ft. for barrows, or 58 ft. longer haul for truck.

Difference in cost favoring electric truck—Hauling per ton, $ .051; double this for setting and emptying, $ .102.

On 24,000 tons, at 10c, $2,400.00.

Data on performance of electric truck, December 23, 1912. Against yearly average for 1912—haul 537 ft.

Emptying Kiln No. 15—2:15 p. m. to 4:30 p. m.—2 hrs. 15 min.

125—2 A 7	7,625	4 loads at 426 ft. each	1,704 ft.
58—5 S 6	3,480	3 loads at 600 ft. each	1,800 ft.
14—2 A 6	1,316	1 loads at 240 ft. each	240 ft.
158—3x9x20	6,320	3 loads at 600 ft. each	1,800 ft.
	18,741 lbs., 11 loads or 9.375 tons		5,544 ft.

Average number ft. each load, 504.
1 man—21½c per hr.
3 men—17½c per hr.
Total cost, $1.65.
Average cost per ton, $ .176.
Time—45 min.

24—90 R	2,064	1 load at 411 ft. each	411 ft.
68—5 S 6	4,080	2 loads at 600 ft. each	1,200 ft.
	6,144 lbs., 3 loads or 3.072 tons		1,611 ft.

Average No. ft. each load, 53.7.
1 man—21c per hr.
3 men—17½c per hr.
Total cost, $ .55.
Average cost per ton, $ .179.

Average of above, $ .1775—

Double this for setting and emptying	$ .3550
Add for wicket, say	.01
	.3650
Against average yearly cost, 1912	.5198
Saving per ton	$ .1548
14c per ton on 24,000 tons yard handling—.0766	$1,838.40
24,000 tons bldg. handling—.0766	1,838.40
	$4,676.80

We are also using a special truck for handling gas retorts. This was built on our yard and has paid for itself several times over sincc it was installed.

A Trainload of Supplies.

Itemizing all data without considering the wicket, we have the following results:

Sheet 2,	Ft. 501, cost per ton,	$ .256	Ft. 577, cost per ton,	$ .16
Sheet 3,	Ft. 285, cost per ton,	.129	Ft. 483, cost per ton,	.121
Sheet 4,	Ft. 420, cost per ton,	.197	Ft. 478, cost per ton,	.146
Sheet 5,			Ft. 504, cost per ton,	.176
Sheet 6,			Ft. 537, cost per ton,	.179
Av.	ft. 402 3)1206	Av. cost $ .194 3).582	Av.ft. 512 5)2559	Av. Cost .156 5).782

Studying the above table, we find that with 512 feet haul for truck against a lesser haul of only 402 feet, there is a saving of the difference between $ .194 against $ .156 a ton, or $ .038 per ton, notwithstanding the longer haul of 110 feet reducing the barrow haul to truck feet of 512, the cost of the barrow haul would be figured as follows:

If it costs $ .194 per ton to haul 402 feet, it would cost $.0004826 per foot, or for 512 feet the tonnage cost would be $ .247 per ton. This, compared with the same average haul cost of 512 feet. $ .1564 per ton for truck haul, would mean a saving of $ .0906 per ton for emptying only, or a saving of $2,160.00 on 24,000 tons emptying, or $4,320.00 on emptying and setting. The wicket cost remaining the same in either case.

Cost of charging truck battery, by outsiders, per day	$ 1.00
Cost of charging truck battery, by factory, per day, times 300 working days	84.00
Cost of new battery, one renewal	103.00
Cost of tires	80.00
	$267.00

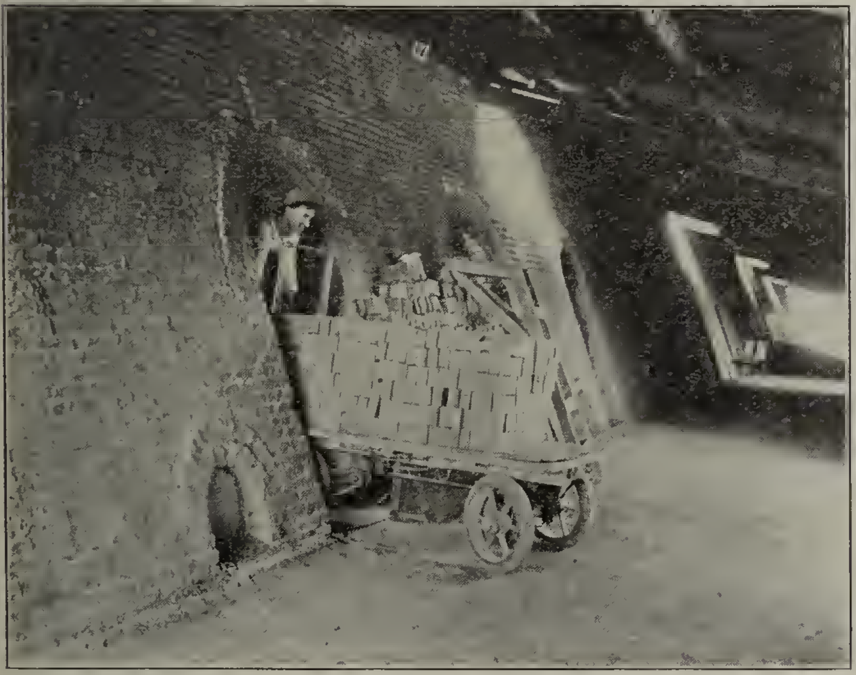
(Applause.)

President Deckman: We will be very glad to have Mr. Richards lead in the discussion of this subject.

Ben. H. Richards, Edwardsville, Ill.: Mr. President and Gentlemen: In discussing the subject of electric truck methods versus the usual wheelbarrow methods of handling brick or other clay products, I can only give you the results of my own observation, made in the short time we have used the electric truck, which is less than a year. In fact, we have up to date no accurate cost figures on the subject, but have found out some things in a general way.

Our company first became interested in the possibilities of the electric truck about two years ago, when we had under consideration the installation of a loading spur from a railroad line which passes our plant at a distance of about 900 feet from the nearest kiln, and on a level 30 feet lower than our kiln floors.

Private Brick Paved Roadway.



Emptying a Kiln Chamber.

On account of engineering difficulties because of the considerably lower level of this railroad, and because of the deep cut and fill, as well as the sharp curves necessary for the installation of such a spur, we found the cost would be almost too high to justify us in making the improvement, as we already had loading facilities from another railroad directly in front of our plant, and wanted the new spur merely to give us another independent outlet for our product and to open up a little new territory.

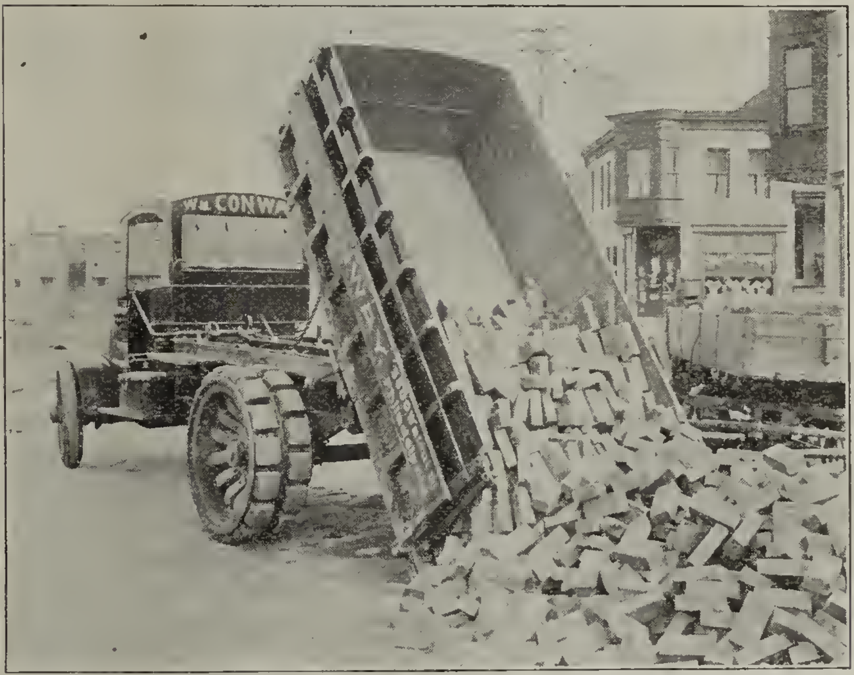
So, as a result of our investigation, we did not attempt to bring the spur up to the kilns, but solved our problem by simply putting in a short spur along the main line of the railroad in question and purchased an electric truck to use as a means of conveyance from kilns or stock to car.

In Mr. Parker's paper he makes the statement that there is a large saving where the material is moved a distance of over 200 feet, and I agree with him in this. From personal observation, at least, I do not think that the electric truck at its present price can be made to pay on short hauls. It is hard to beat the man with the wheelbarrow on short hauls, but we cannot always arrange things as conveniently as we would like, and are often confronted with the necessity of loading cars from a stock pile or kiln some distance away.

Here is where the electric truck comes in particularly handy, for, in a way, it eliminates the factor of distance, and we have found that we can load cars at this new spur with an average haul of over 1,000 feet practically as cheaply as at the nearby track with barrows. Furthermore, we do not have to worry about whether the material to be loaded comes from the nearest kiln or stock pile—it can come from any part of the plant with equal ease—and we are saved the annoyance of a depressed track at a place where we did not want it, and where it would not have completely served its purpose.

WILLIAM CONWAY, BRICK MANUFACTURER, 58th. & Walnut St.
WM. CONWAY, 58th & Walnut Philadelphia
2

A Loaded Motor Truck.



Manner of Dumping Motor Truck.

In my judgment, there are three ways in which the electric truck may be used:

First, by loading the truck itself each time, running it to destination and unloading.

Second, by using trailers in connection with the truck and using the truck principally for motive power, thus keeping it on the road as much as possible.

Third, by using portable platforms which can be loaded in the kiln or at the stock pile, and picked up by the truck, carried to destination and set down, the truck returning for another load.

The first method is only practicable and economical where the ware is of such size that the truck can be loaded and unloaded very quickly, and it would hardly pay to purchase a truck to be used in this way on the average brick plant. The second or third schemes will work out much better, as a great deal more tonnage can be handled daily by either of these methods. We ourselves are not yet much past the first stage, having only two trailers at present. We are, however, building a few more at the present time and gradually expect to increase the number until we can use the truck in the most economical manner.

There are many possibilities open to the use of the electric truck, for it has a number of advantages. It will go almost anywhere a wheelbarrow will go and carry and pull many times the average wheelbarrow load. It will go up grade or down, with almost equal ease, and can travel seven or eight miles per hour with its load. It is provided with suitable springs and does not jolt and scratch your ware. The operation of it is simple and the cost of upkeep of a well constructed and substantially built truck is not great. I believe the first trucks which came on the market several years ago tended to "eat themselves up," as the saying goes, with their cost of upkeep, but trucks can be bought now that are built along substantial, liberal lines, with a view to standing up under just such conditions as prevail around the average clay plant. I have a few slides which I will show you which were taken at Mr. Parker's plant. (Applause.)

Secretary Randall: There are two more illustrations here which were taken at the plant of William Conway, of Philadelphia, which I thought you would be interested in. Mr. Conway seldom misses a convention, but two weeks ago he had a slight stroke of paralysis, but he hopes to be up and about soon. However, his son is representing him. Mr. Conway uses automobile trucks for delivering the brick from plant to job. I presume the hauling of brick by electric truck or gasoline truck instead of horse has reached as high a degree of perfection here in Cleveland as anywhere else in the country, and those of you who want to know the relative cost of hauling by this method can consult the Farr Brick Company or Mr. Lawrence Koblitz, of the American Brick Company, who has been helping us so much this week, and can get full information.

Wm. Sankey, Pittsburg, Pa.

President Deckman: The next thing on the program is "Safety in Clay Products Plants," by C. A. Millar, of Toronto, Ontario, Canada.

"Safety in Clay Products Plants."

C. A. Millar: I have a paper here which I am not real sure I am going to read. However, it is not very long. First of all I have had it in mind that a good many here would be interested in the Workingmen's Compensation Act which was prepared at considerable time and expense. Most of us considered at the time that it was more for the workman than the employer, and the more you study it and get in touch with it, the more you will come to the conclusion that it is as much for the employer as for the employed. We could see from the first the effect of eliminating a great many of the law suits in connection with accidents. In some of your states you have a workingmen's Compensation Act, but in others you do not, but it is one of the coming things. It is framed with an idea of eliminating a great deal of the losses. Formerly if a workingman had his hand injured, he could get a jackass of a lawyer to start a suit for anywhere from two, three or four thousand dollars, and the employer had to take up his time and hire a lawyer and defend himself. I do not pretend to say the act is right. It is right in the main features, but in a great many of the features it is not right. We have come to the conclusion that there are a great many amendments to be made to the act before we think it is right. There are a great many weaknesses, but when you consider that this has only been in force since January, 1915, it is doing very well. When we investigated it we came to the conclusion that it was working fairly well. From the title of the paper it would indicate that it was along safety lines in clay products. It is to a certain extent, but it is very hard to get any statistics in regard to clay product plants. In our country it is almost impossible. You cannot get certain men to give you any information covering statistics, or at least it was up to January, 1915. They did not make any reports of accidents; they gave their employes the damage and let it drop. But in the Workmen's Compensation Act they have to report all accidents.

SAFETY IN CLAY PRODUCTS PLANTS.

By C. A. Millar, Toronto, Ont.

Mr. President and Gentlemen of the Convention.

As time passes and the state of civilization advances, new conditions present themselves for adjustment and new phases have to be coined to keep pace with the onward movement. During the past few years life and limb, which used to be considered of small account, have advanced in value to such an extent that some tightwads think it is being overdone; but surely, with the awful wastage of life on the battlefields of the old world, we must conserve every available workman at home, and with that end in view "Safety First" was born.

To the traveler these words become almost monotonous, for, while the railroads agree to differ on almost all other subjects, they seem unanimous on these words as a slogan for their workmen and patrons. On almost every tool house, station, semaphore, hand car, and car steps these words meet the eye as a continual reminder that danger is near. How many lives have been saved by these words cannot be calculated, for they are in the same class as the girl who, when writing a composition on "Pins," after explaining at some length the different kinds used, closed with the statement: "Pins have saved a great many lives by people not swallowing them."

Of all commercial enterprises of Canada and the United States, as far as accidents are concerned, the railroads are the most fruitful source, and that not only with their employes, but with citizens who have absolutely no business trespassing on their tracks and right of way.

Of this class, about twelve thousand every year, or about thirty-three every day, are killed or injured by taking short cuts to work, riding on freight trains, catching on to moving trains, etc. Of actual employes of railroads in these two great countries, about eleven thousand are annually killed or injured, about 40 per cent. proving fatal.

Following hard in the wake of railroads, come the iron and steel industries, and you have only to glance at the yearly report of the factory inspector's department to see how serious this is. Hundreds of cases are here set down, and from the regularity with which they occur you are forced to the conclusion that this is a part of the day's business.

The lumbering trade, ship building, saw mills, all claim large toll from the wage earners as the material is converted from raw to finished product ready for the world's market.

Coming to the clayworking industry, we find that we have been particularly fortunate during the year 1915. In Ontario we have had no fatal accidents and very few serious ones, which speaks well for the care that has been exercised both by employers and employes. About sixty accidents have been reported and dealt with by the Workmen's Compensation Board in this particular line. Nearly every part of the works has contributed to the list, but closer inspection reveals the fact that clay banks, rolls, gears, cables and set screws are the sources which have contributed most. If every employer would make a thorough inspection to see that his plant is made as safe and fool-proof as it can be, there is no doubt but what our assessments will come down.

Might I be permitted to say a few words to the manufacturers of machinery for clayworking plants? In many of the larger plants which I have had the pleasure of visiting in my work, the thought of "Safety First" seems to have never entered into the contract at all. The policy of least resistance seems to be the one usually taken, with the result that even an outsider would notice some glaring defect that might easily have been remedied had the man who made the plans thought with safety on his side.

Will you not see on your return home that the machinery you manufacture is guarded so that a man cannot get tangled up in it, and ask your engineer in laying out a plant to be sure and make it safe, even if it takes another countershaft? If we can get the manufacturer of machinery, the employer and employe educated so that in all they do, the thought of safety is uppermost, we will then be on the highway that leads to elimination of accidents in our own particular industry. (Applause.)

Mr. Millar: I want to say in addition, when the act went into effect the first of January, 1915, I immediately sent out an assessment to every man in the clayworking business, and assessed him on the last year's assessment he had sent in. If you know what you are going to pay for wages, and then, at the end of the year, if you find you have paid less or that you have overpaid, it simply applies to 1916. The same thing if you have paid too little, you have to pay more for the next year. It is handled by a commission of four men appointed by the government. We think no better men could have been selected; they were not selected for their politics, and I think it will work out satisfactorily to all concerned. (Applause.)

Warren Griffiss, Baltimore: What is your rate?

Mr. Millar: Ninety cents on the hundred dollars.

Mr. Griffiss: Do you get a general credit? That is, does the clay industry get a credit by reason of the fact that it has fewer accidents? Has the clay industry a separate rate?

Mr. Millar: Yes, we get a credit. The clay industry is separate and our assessment will probably be cut to 75 cents or so.

Mr. Griffiss: We have our own record this year and we sent out a schedule to other clayworkers in the state of Maryland and we got answers from quite a number of them, and these we tabulated showing that the liability in our particular industry is very low. I think ours for a period of ten years perhaps was about 23 cents. Our rate according to the act was $1.79, subject to certain credits if we put in certain preventative devices. We put in the apparatus and we have the rate largely modified, but not near the rate we think we are entitled to. They still have it over one dollar, and we think about 23 cents would be about right, that is what our experience has shown. Suppose it is 50 cents. If 25 cents is right we would be willing to pay 50 cents. It is handled very differently with us. The government does not handle it altogether. A number of us have gone into the various casualty companies.

Mr. Millar: Before this act came into force, I think the brick men who had plants in fairly good shape had a fairly good casualty rate, about 40 or 42 cents. We may in time get this workman's compensation down to about 40 or 50 cents. I figure that according to the accidents we have we can get this down to about 40 or 50 cents, but it will take us a number of years to get this adjusted. The board is not going to be in a hurry to cut it down, for they may have to raise it again. It will be easy to cut it down, but there would be a great kick if they raised it again. Each class will get credit. Every class is to be kept separate.

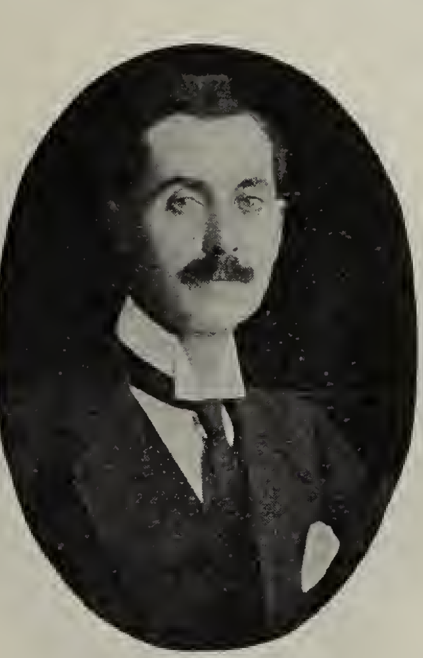
Geo. J. Walters, Chattsworth, Ill. Is that the rate on one hundred dollars?

Mr. Millar: Yes, on the payroll.

Mr. Kane: Does it make any provisions for inoculation of diseases. Pennsylvania is getting into that.

Safety First.

Mr. Eisenhart: I have contracted a very bad cold and yesterday I could not speak at all, and it is with difficulty I speak today. Mr. Millar has so well covered the subject in his paper that I hardly deem it necessary for me to take it up. However, this matter of safety first, as we all know, is receiving world wide recognition. Everybody realizes the necessity of safety. My way of looking at this Workman's Compensation Law as passed in some of the states, is that it is the greatest booster we can have, and do have in this matter of safety. It is for the benefit of the brickmaker or any other manufacturer who is working under the Workman's Compensation Act, even more than the employe. New York was one of the first states to pass a compensation act, and the first act looked to me and to most others pretty bad, and it was decided that we would test it and prove it unconstitutional. We have a gang down in Albany headed by Mr. Murphy and another headed by Mr. Barnes, and we make the thing go, and they gave us another act that was all right. Talk about the rate being high, I am glad I live in New York, for we have the pleasure of paying five or six times as much as they do in Canada. The only thing we are justified to do is to insure with a regular casualty company. We have a state arrangement, but one way or another, our politicians have arranged that the state insurance is as expensive as casualty, so I insure in a casualty company, and my rate is anywhere from 2½ per cent. to 10 or 12 per cent., depending on what the men are working at. At first we thought it fierce, but fierce as it may seem as you go along with it, the more you become interested in this safety first above everything else. We have two things to keep us interested. First is the state inspector who occupies a political appointment and has the law of the state back of him. Anything he says must of necessity go. He tells us what to do and we do it very cheerfully. Next comes the inspector from the insurance office. He represents the insured just as much as the insurance company. If they make a ruling, the man obeys strictly these instructions, and is able to have his insurance reduced; and, if he doesn't obey, up it goes. I think the workmen's compensation act is a good one. It gives the greatest protection to the workman, in that the proprietor will make everything just as safe as he can. At first when you get your list of instructions you think you never can comply with all of them; but you can. We have at our works a semi-continuous kiln. In the center is the transfer track. Now the man who conveys the car from the dryer to the kiln has a hard job, and when he is taking the empty cars back he has a habit of jumping on the car and taking a ride, and every once in a while he bumps into something and is thrown from the car, and a mashed foot or hand is the result. We have had a lot of trouble in this way. After we went under the compensation law we tried to find a way to make this safe. We found two ways. The first was to issue orders that the men must not get on the cars, and the second was, when he did not obey, to put someone else in his place. Whenever help was plentiful, we used the first; that was. "If you get on, you get out." When labor is scarce, we use our persuasive powers and coax him not to. I could mention other instances, but there are three of my own men here, and I don't want to point out too much. They are here as my guests, and as a matter of safety first I concluded it would be a good plan to bring these men along and let them hear what was going on; and it would add to their efficiency, and I think that is a good plan. If any of you want to follow that plan, I would advise you, as a matter of safety, as soon as Mr. Randall advises the place, that you write in and reserve your rooms as a brickmaker; tell them how many floors up you want to go, and they will furnish you a chart, and you can choose your own room. As a matter of safety, after you



Chas. A. Millar, Toronto, Ont., Canada.

arrive at the hotel, convention week, give your wife your grip and your umbrella, and let her take care of them while you go on down to the office. And, as another matter of safety, make them acknowledge the letter ordering your rooms, and then bring that letter along so you will know just where you are. When you get up to the office, you can show the clerk the letter, and he will call a bellboy and give him a key, and you will get your wife and grip, and he will take you up to the eighth floor when you expected to get out on the third floor. When you get to your room, don't begin to kick, but go in and congratulate yourself that you got a room. (Applause.)

President Deckman: If there is no further discussion on this question of safety, we will pass on to the next subject, "The Burning Question," by Anton Vogt, of Troy, N. Y.

THE BURNING QUESTION.

BY ANTON VOGT.

Gentlemen of the Convention:

Years are rolling by, never to return, like the water that drives the wheels of the mills, and many clayworkers are still struggling to settle "The Burning Question."

It is a question of the greatest importance in the clay industry—a question which many have answered to their entire satisfaction by installing at a trivial expense, considering the increased sure profits—a pyrometer system, to indicate at all times the temperature in their kilns. Many have refused to be progressive, striking a blow to scientific assistance in burning their kilns, when, as a fact, they strike themselves. They say they cannot afford to install a pyometer system to their kilns. *They are mistaken.*

J. E. Frid, Hamilton, Ont., Canada.

Cost of Installation.

From past experience and records, a well-known pyrometer company figures that the installation of their method costs from two and a quarter cents to eight and one-half cents per ton of ware in the kiln, for the first year, and from *one-tenth* of a cent to *four-tenths* of a cent per ton for maintenance for the second year and after.

Earnings.

They claim, and they can prove, that savings have never been less than 6 cents per ton on common brick, burned in continuous kilns, and from that to $1.00 per ton for face brick, and certain kinds of hollow ware burned in downdraft kilns.

Remember, you do not have to make radical changes in the operation of your plant. Burners, except those who know better now, are often against pyrometers and belittle and laugh about the professors, as they call 'em, who install the systems. I know many burners who were educated to the new method of burning with the help of pyrometers and convinced that they were being helped and not hindered in getting results and in maintaining their jobs and reputations.

Who Uses Pyrometers?

The answer is: The largest clay manufacturers all over the country have a pyrometer system; they are *not* burning by *guess;* they burn their clay products the *sure* way. They do not get a few *good* kilns one time and a few *bad* kilns other times. They know they have a system that is *right, practical* and a *paying* investment, or they would throw it out. Nothing goes with a large, up-to-date, modern, progressive plant that does not give better results and an increased profit. If the big men who operate kilns by the dozen or hundred are using *better* methods, why should not the small clayworkers fall in line and adopt *modern, better* methods The cost is in proportion.

Does It Really Pay for a Small Plant to Install Pyrometers?

We say, emphatically, "Yes!"

Suppose you are one of the many who have only one or two kilns. Perhaps you have a tender clay, where the range between *burning hard* and *fusing* is very close together, sometimes only 50 degrees apart. You know, many times you will find the top overburned; the ware there and around the bagwalls is ruined; the bottom too soft to be saleable, you know. You are losing money.

You will say: "How will a *pyrometer* overcome these defects and stop the loss? The answer is simply this: A pyrometer indicates at every fire the degree of heat at the most dangerous zone in the kiln, and you can, when necessary, slack off firing and let the fires burn down, admitting air from the outside to temper and reduce the excessive heat.

You naturally argue that you might ruin the ware in the kiln by letting the fires burn down and letting cold air in. I assure you there is no danger of this. You say: "Your clay air-checks easily." *No clay* will air-check so long as it is *redhot.* Air-checking takes place when burned clayware cools and changes from *redhot* to *dark.* Of course, I do not mean when I say to let the fires burn down that you should let the fireholes and bagwalls get black.

When your pyrometer shows that you are getting too much heat, simply do not fire any more until the heat goes down about 100 degrees Fahrenheit, and to prevent the fireholes and bagwalls from getting black, either close the fireholes, or, if you have a damper at the stack, cut off the draft and the air will only flow into the kiln slowly, as the reduced draft at the stack will hold it in the kiln longer to mix with the excessive heat. It will take a little longer to put the kiln in a better firing condition.

But you will say: "Will I not lose a lot of heat?" Yes; but you can *afford to lose that heat on top,* driving it to the *bottom,* and so *gain without* burning up any *fuel.* When you reduce the heat above 100 degrees, as stated above, you do no harm; you simply do this: You stop the shrinkage or settle of the ware where it is already hard enough, and when firing again, fire lightly and often, to get the original heat that you had before letting the fires burn down, and try to keep it there. If it should go higher, you cannot hurt the ware any more; you have stopped the shrinkage and you have created the best condition to get the heat to the bottom. If you repeat this a couple of times, you can burn the ware nearly as hard on the bottom as on top, without overburning any part of the kiln, provided you have a practical kiln.

Without a pyrometer, very few burners, if any, can say with accuracy how many degrees of heat are in a kiln, especially at night, when the reflection of the fires makes the heat appear much brighter than in daytime.

With a pyrometer, the burner can see at a glance how much heat there is in the top of the kiln; and, if excessive, he can regulate the fires to prevent overburning on top, and so produce a uniform burn.

Where one has only a couple of kilns, like in many yards making brick and tile on a small scale, only a yard indicator and switchboard are required, as in most cases the proprietor attends to the burning himself.

If a small brick and tilemaker invests a couple hundred of dollars in a pyrometer, the system would pay for itself in less than one year. He can for himself settle "The Burning Question."

In large plants, however, where a number of kilns are on fire at the same time, it is advisable to also install, besides the yard indicator, a recording and indicating instrument, which provides for a check on the burner, only the superintendent and members of the firm having access; and if a burner should try to hide faulty firing, it would easily be detected in the office.

There has been much said and written that pyrometers will not burn the ware. I admit that; but it shows with accuracy the heat where the element is connected, and the burner can easily judge the heat at that place and compare the heat in the other fireholes. If he is a judge of heat, which he should be, he can maintain a nearly uniform heat in all parts of the kiln. It is true the pyrometer does not prevent the overburning of a kiln, if the burner does not watch. But *this* will the pyrometer do: It will *show* the danger, and the burner can prepare for it *before* any damage is done. *Without* the pyrometer, the burner is like one at sea without a compass; he is like an engineer without any steam gauge. He is guessing and in constant fear that something might happen.

The Pyrometer as a Fuel Saver.

Many thousand tons of coal are wasted annually with the old guess method of firing, without temperature indication,, and therefore not knowing when to stop.

It takes only so many degrees of heat to burn certain clays to a commercial saleable product; and how many tons of coal are burned up after that stage is reached? Often ware is ruined, simply by not knowing how hot the kiln is. The heat is increased without noticing it until too late.

Water comes to a boil at 212 degrees, and to increase the heat *will* not make the water boil *more;* it will only evaporate it. So with burning clay. When once the desired hardness is reached, it is folly to increase the heat or to keep on firing after the kiln is done at the bottom. It will only evaporate the life (which gives it body) out of the clay; it will not make a harder clay product, unless the heat is increased.

It is a mistaken idea that clay burns harder after finishing a kiln by holding the heat. It does not get harder, unless firing is continued and the heat raised; and when this happens, you can *hear* the ware in the kiln settle when falling into the fireholes.

When you use a pyrometer, you can save fuel by stopping when the indicator shows a certain heat on the bottom of the kiln. By careful watching, a burner can keep the top of the kiln nearly at a certain temperature for such a length of time, until he gets the heat to the bottom; but he can do it only with safety by the means of a pyrometer, and *not certain* in any other way. With his trained eye as the guide and judge, he does *not* know with any degree of certainty how much heat he has got in the kiln. I know this to be a fact, notwithstanding the claims of some burners of the old school to the contrary.

When burning a clay or shale high in carbon, the burner often loses much valuable time, neglecting to raise the heat to the important point to expel the carbon at the quickest possible time; or, he may go too fast and confine thereby the carbon, and in doing so the unconsumed carbon would not get a further supply of oxygen or air. These confined, enveloped carbon gases, when in a highly heated condition, become very active and produce (as many no doubt know) some very peculiar and detrimental results, producing swelling and black core. Such conditions are very difficult to overcome; and, in fact, it is substantially impossible to overcome them with any degree of certainty without a definite means to control the heat; and it is here that the value of a pyrometer becomes apparent to prevent swelling and black-coring. I would, however, caution you not to let an inexperienced man install a pyrometer, to save a few dollars; but I wish to impress upon you to be "Sure that you are right, then go ahead," and have the manufacturer who makes *all* parts of the outfit install the system, not one who buys a piece here and there.

When asking for estimates, furnish the following data: Size and number of your kilns, type of kilns; nature of material burned, brick, tile, fireproofing or sewer pipe. Give approximately the degree of heat that your clay will require, character of the fuel burned and how much per kiln, length of time now consumed to burn and cool the kiln. Further, principal cause of loss and depreciation in quality, and thickness of kiln walls at top and bottom.

In conclusion, I will give you a copy of a few solutions of burning questions:

BURNING QUESTION NO. 1.

Brick.

By old method; average, 21 kilns burned:

Hours burning	216
Coal consumed	42 tons
Per cent. firsts	66

Pyrometer method:

Hours burning	168 against 216
Coal consumed	37 tons against 42 tons
Per cent. firsts	81 against 66

Savings per kiln:

In time	48 hours
In coal	5 tons
First quality ware	15 per cent.

BURNING QUESTION NO. 2.

Hollow Ware.

Average of 54 kilns burned. Coal at $2.38 per ton. Without Pyrometer, in various plants:

Average time burning	180 hours
Average cost for coal per ton of ware	69.3 cents
Average percentage of firsts	77.4

Using pyrometer method:

Average time burning	132 hours against 180 hours
Average cost for coal per ton of ware	45.2 cents against 69.3 cents
Average percentage of firsts	91.3 against 77.4

Savings:

In time	48 hours
In coal per ton of ware	24.1 cents
In first quality ware	13.9 per cent.

BURNING QUESTION NO. 3.

Conduits and Tiling.

Average cost of coal per ton, $2.64. Average of 57 kilns burned. Without pyrometer:

Average cost of fuel per ton of ware	$1.72
Average time of burning	180 hours
Average per cent. of firsts	71.2
Average per cent. of seconds	21.1
Average loss	7.7 per cent.

With pyrometer:

Average cost of fuel per ton of ware	91.67 cents against $1.72
Average time of burning	120 hours against 180 hours
Average per cent. of firsts	89.11 against 71.2
Average per cent. of seconds	9.49 against 21.1
Average loss	1.4 per cent.

Savings:

In fuel per ton of ware	80.33 cents
In time	60 hours
In first quality	17.91 per cent.
Of loss	6.3 per cent.

BURNING QUESTION NO. 4.

Sewer Pipe and Tile.

Average cost of coal per ton, $2.71. Average of 91 kilns burned. Without pyrometer:

Average cost of fuel per ton of ware	$1.787
Average time of burning	168 hours
Average per cent. of first quality	78.6
Average per cent. of seconds	13.3
Average loss	8.1 per cent.

With pyrometer:

Average cost of fuel per ton of ware	95 cents
Average time of burning	120 hours against 168 hours
Average per cent. of first quality	87.7 against 78.6
Average per cent. of second quality	10.6 against 13.3
Average loss	1.7 per cent. against 8.1 per cent.

Savings:

In time of burning	48 hours
In first quality	9.1 per cent.
Saving of loss	6.4 per cent.

Marion W. Blair, Thornton, W. Va.

From these figures, which are bona fide, you must admit that the right kind of a pyrometer installation is a paying investment and a big help for the man who has charge of the kilns. It saves a lot of worry and disappointment; it saves coal; you can turn your kilns oftener, thereby increasing the capacity of your plant, and it increases the percentage of No. 1 ware. It reduces the percentage of seconds and stops most of your loss, which is the biggest leak in the business of many clayworkers. In my opinion and from past experience, I consider the pyrometer a great advance over old guesswork methods.

Think it over and act to settle *your* "Burning Question."

You cannot go wrong. You are right; and, when you are sure that you are right, then go ahead.

Remember what Dewey said at Manila: "Fire when you are ready." (Applause.)

President Deckman: The discussion of this paper is to be led by Marion W. Blair, of Thornton, W. Va.

Efficiency in Brick Plant Management.

Marion W. Blair: There are two or three items in this paper I might speak of. The paper deals with the use of pyrometers in the burning of clay ware; that is, the writer advocates the use of pyrometers and cites a number of instances where they have proved a saving. For instance, in burning hollow and other ware, the difference in burning with and without pyrometers is shown. The value of pyrometers has been fully demonstrated all over the country, both in the saving of ware and the saving of fuel. There is no question about it. It is simply up to the individual manufacturer to decide whether he has got the money to pay for it or whether he can save enough to pay for it, and then select the character and type best adapted to his needs. It is one of the efficiency needs of the plant. Anybody can be efficient in a great big way and show a saving over the small manufacturer if he has the money to spend. A plant of 100,000 capacity, laid out by expert engineers, will show a big saving over the little fellow only making 30,000 per day. The earning power of increased investment, however, is not efficiency. Efficiency is getting the very best out of the machine you are working, getting the No. 1 quality ware out of it, and the very best service it will afford. Design and installation may affect the efficiency of a plant. For instance, it is not efficiency to have the elevator pulley and gear so near the same size that the belt runs off the pulley into the gears. It is not efficiency to build a conveyor with solid brick walls, and leave no space for a man to get under to clean it out. It is not efficiency to arrange elevator heads in such a way that the dumping on the screen is only two or three inches wide, and you lose the efficiency of your screen. The pyrometer proposition is only one of these things.

The small clayworking plant can be improved by efficiency methods. But to an efficiency expert, the proprietor will say, "Oh, we saw that before; we are going to change that after while; it is not working right, but we have been so busy we have not had time to fix it." The thing to do is to fix it. If you have to do it, do it now. If you have to shut down the plant to make the improvement, shut down; you will get the benefit of the increased efficiency from the better condition of the plant; and the way to settle the pyrometer argument is to install one. (Applause.)

R. G. Eisenhart: When you talk on the question of gears, when you get under the compensation act, you will have them all covered up.

Mr. Gregory: In reference to the pyrometers, we investigated the question and we installed a complete system, and I must say it paid for itself in one year. The burners get better burns, and they refer to it every hour. When we first put it in, the burners were opposed to it, but now they like it and follow the charts fully. I cannot say too much for the pyrometer on the brick plant.

Mr. Eisenhart: The worst thing I know about this pyrometer business is that Mr. Gregory and I are only fifty miles apart, and I used to be able to call him up over the phone and talk to him whenever I wanted to, but now when I call him up they say he is out watching the pyrometer. (Laughter.)

President Deckman: If there is no further discussion on this question, we will take up miscellaneous business.

Professor Orton: I have the report of the Committee on Technical Investigation that I would like to submit.

REPORT OF COMMITTEE ON TECHNICAL INVESTIGATION.

To the National Brick Manufacturers' Association:

Gentlemen—Your Committee on Technical Investigation, at a meeting held February 24, reached the following conclusion concerning their work, which they desire to transmit to the society for their consideration and action:

The Pier Test Investigation—The committee is able to report that some headway has been made during the past year and that the investigation is about two-thirds complete, possibly a little more. Brick from the Pittsburgh and Chicago districts have been secured, piers built, aged and crushed and the data studied. It is important that material for a similar study from one more large district be secured, preferably the New York district. The Bureau of Standards estimates that it will cost $190, expended at the bureau, to enable them to complete their part of the work. The committee believes that it will be able to secure the necessary brick laid down at the bureau free of expense. The comparatively small amount of money required to complete this large and important investigation should certainly assure the prompt furnishing of this fund.

The Natural and Artificial Freezing Test—The committee is of the opinion that an investigation should be undertaken at this time along the lines of the study reported at this convention by Professor Orton. This work seems to the committee to be of more direct and intimate interest to every manufacturer of building brick than any other problem now attracting attention. The committee desires very strongly to start this work at once and to devote the full amount of this year's appropriation $250.00 to this purpose, the execution work to be entrusted to Professor Orton in continuation of and extension of the work already begun.

Co-operation with the American Society for Testing Materials—The committee believes that the work it has done in the pier test work and which it desires now to undertake on the freezing test will be of very great value and importance to Committee 3C of the American Society for Testing Materials, which is working on the problem of the classification of building brick. It therefore requests permission from this association to enter into co-operative relations with Committee 3C for the better and more rapid settlement of the problems of the brick industry.

In conclusion, the committee desires to ask that the money available for its use for the current year be increased to $440.00, $190.00 of which to be used to complete the pier test, $250.00 for beginning the freezing test.

Very respectfully submitted,
EDWARD ORTON, JR.
F. H. KANENGEISER.
A. V. BLEININGER.
MARION W. BLAIR.
W. D. RICHARDSON.

President Deckman: You have heard this report; what is your pleasure?

Charles H. Bryan, Detroit, Mich.: I move the adoption of the report, and that the resolution be concurred in.

William Hammerschmidt. Lombard, Ill.: I second the motion.

Motion carried.

Membership Fee Increased.

William B. Wreford: This report carries a matter of some finance and will probably wipe out the surplus in our treasury. We have been going along for a period of thirty years on a basis of a $3.00 membership fee, and I know of no organization that operates on such a low fee. I am sure that every member gets at least $5.00 worth or more out of these annual meetings alone, to say nothing of the other benefits to be derived, and I move that the yearly dues of this association be raised to $5.00 for renewal fees and $7.50 for new members.

W. D. Richardson, Columbus, Ohio.

M. E. Gregory: I second the motion.

President Deckman: You have heard the motion, gentlemen. Does anybody desire to speak on the question?

Warren Griffiss: I think a resolution of this sort should not be acted on at a meeting where there is so small an attendance. We should have some notice. It is not a question as to the merits of this particular movement. I think something of the kind ought to be done, but it ought to have more attention than to just bring it up at the tail end of the meeting, without a larger attendance.

Mr. Wreford: There is nothing very revolutionary about the movement. It is almost a necessity to carry on the work of the N. B. M. A. I do not think a $2.00 increase would be very revolutionary, and I think $5.00 is low enough for a membership fee for an association of this kind.

Marion Blair: While it is true there are a great many members of this association who would be perfectly willing to pay $5.00 a year, we are already put to a considerable expense in the finances of this association by firms carrying a firm membership for one and then bringing in a half dozen other men to enjoy the benefits of the convention and labeling them "guests." Now unless there is some rule in connection with the guest proposition adopted at the same time with that resolution, it seems to me we would be worse off than we are now, because a few of the men would pay $5.00, and they would have more guests. Therefore, I move—I believe a resolution to refer is always in order—I move that this resolution be referred to the executive committee for consideration.

Elisha Kane: I second Mr. Blair's motion to refer this matter to the executive committee.

Secretary Randall: It was agreed by the executive committee last year that one membership would carry with it but one guest badge.

Professor Orton: I move an amendment to Mr. Blair's motion that this be referred to the executive committee with power to act.

Mr. Hammerschmidt: I second the motion.

Marion Blair: I accept the amendment.

Mr. Kane: I also accept.

President Deckman: The question now before you is on the reference of this question to the executive committee with power to act.

Mr. Mayer: Mr. Chairman and gentlemen: Since I have had four years of connection with the official family of this organization, and since our secretary has not had any fixed salary, but simply just been allowed $350.00 for expenses per annum, it makes me feel as though this were a charity association. I would therefore voice the sentiment that the secretary have a regular salary. I had it in mind before this discussion arose that I would offer a resolution that the fees be increased in order that we might pay the secretary's salary; but some of the members seemed a little averse to that idea, and therefore as a member of the executive committee I would ask, I would advocate, that the salary of the secretary be fixed at not less than $50.00 a month by the executive committee, and that it not be known as expenses, because that expense has been a talking point for some of our close-fisted members; and, if we put him on a salary, I think it would be better. I wish we could pay him $90,000.00. I feel he ought to be paid that. We have paid him nothing. If he had devoted as much knowledge and energy and time and intelligence to any other business, I assure you he would have had more than $90,000.00.

Fred Talbot, St. Louis, Mo.

President Deckman: Mr. Mayer, you must confine your remarks to the question before us rather than to a salary for the secretary.

Mr. Mayer: I thank you, Mr. President, for calling me to order, I am ready to support the motion to increase the annual dues.

Motion was put and carried.

President Deckman: You have voted to refer this matter of raising the annual dues to the executive committee and they now have power to act.

Secretary Randall: May I have a word before this thing is ended? I want to explain this proposition. Away back yonder, thirty years ago, at our first convention, this matter of compensation was taken up by prominent members of the association, and I objected to the salary proposition. The association could not pay an adequate salary and I would rather they would make me an allowance for traveling expenses than to make me a fifty-dollar-a-month secretary. It has been one of the joys of my life that I have been able to serve this association for thirty years. I realize if you had had to pay for mere clerk hire, alone, you would have paid out much more than I have ever had. I do not think I am going to serve you for another thirty years.

A Voice: Oh, yes, you are.

Secretary Randall: But I think if I may serve you for another year or two, this will all take care of itself. As a member of the executive committee I want to say this: I think Mr. Wreford is right. There is no other organization in the world that can compare with this National Brick Manufacturers' Association and its work that runs along on less than a $25.00 fee. Take the cement and lumber manufacturers, and they pay $25.00. This work that Professor Orton and Professor Bleininger are doing is important, and it should be supported. Any man not willing to pay $5.00 a year as a member of this association is not worth very much to the association. We need this money for this educational work that is being done, and I do not think I am speaking out of reason when I say I am sure the executive committee will heartily approve of this resolution, in order to carry on the work of this association.

Charles H. Bryan: Mr. President, we can call it traveling expenses or anything we want to; but I make a motion that the convention recommend to the executive committee that we increase what has heretofore been known as the traveling expenses of the secretary to an allowance of not less than $50.00 a month. We are not calling it salary, but we feel that Mr. Randall is giving his services too cheaply, and I think he should have not less than $50.00 a month for his expenses.

Mr. Mayer: I second the motion.

President Deckman: You have all heard this motion which has been regularly made and seconded, that the allowance of the secretary be made $50.00 a month. Are there any remarks?

Mr. Mayer: My idea is to eliminate this expense item, owing to the criticism that some close-fisted members have made. Mr. Randall may not want to be known as a fifty-dollar-a-month secretary, but that is a mere detail. We can affix to it any title that we want to. I simply want to have the matter of expense eliminated. There is the old story you know of the traveling man with a suit of clothes all charged up to expense. (Laughter.) Let us do this thing right. We know this is not as much as we ought to pay Mr. Randall, but let us vote to empower the executive committee to increase this allowance to $600.00 a year. We don't want to look like a two-cent piece with a hole in it. (Laughter.)

Motion carried.

President Deckman: The motion prevails and the matter is referred to the executive committee with power to act. Is the resolution committee ready to report? Mr. Warren Griffiss is chairman of this committee.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Gentlemen of the Convention:

The Committee on Resolutions begs leave to submit the following report:

Whereas, The brick manufacturers of Cleveland have accorded the members of this convention such a splendid welcome and entertained us with such warm and generous cordiality;

Resolved, That the association extend to the brick men of Cleveland its warmest thanks and deepest appreciation of their countless kindnesses and courtesies.

Whereas, The simultaneous meeting of the several kindred and allied organizations in this city has so largely promoted the interest and profit of our convention; therefore, be it

Resolved, That the hearty commendation and approval of this association be extended to our Executive Committee for its action in selecting Cleveland for this meeting.

Whereas, So much valuable and enlightening information has been afforded us by the many able addresses and papers presented at this convention;

Resolved, That the sincere thanks and appreciation of this convention be accorded all who so faithfully and unselfishly served us.

Whereas, The officers of the association have unstintedly given us untiring, devoted service;

Resolved, That we extend to them our heartfelt thanks and appreciation.

Whereas, The unfortunate illness of our beloved fellow-member, Mr. Fritz Salmen, has deprived us of his happy and helpful presence;

Resolved, That the warmest regard of this association be extended him, with the earnest hope for his speedy recovery.

Whereas, It has been the will of Almighty God to call from our midst some of our beloved members; namely, J. R. Randolph, Ruston, La.; J. F. Lewis, Jackson, Mich.; Robert Nesch, Kansas City, Mo.; D. P. Delong, Glens Falls, N. Y.; C. H. Merrick, Syracuse, N. Y.; I. L. Conklin, Philadelphia, Pa.; J. H. Meade, Warners, N. Y.; Benjamin Walcott, Indianapolis, Ind.; therefore, be it

Resolved, That the sincere sympathy of our entire membership be extended to their respective families, and that a copy of these resolutions be forwarded to them.

Whereas, The first American Complete Building Show has proven a most gratifying success in every respect, the many exhibits of all sorts of building materials proved both interesting and instructive and will without doubt prove an influence for good to the building industries of the nation; therefore, be it

Resolved, That the cordial thanks and congratulations of this association be extended to the executives of the show and that we also express our great appreciation of their kindly consideration in extending the courtesies of the show to our members and making the badge of membership alone sufficient for admission into the Coliseum. And be it further

Resolved, That the thanks of this association be tendered to each and all of the various firms displaying building brick and other clay products, for their broad and liberal efforts to bring to the attention of the building world the superior advantages of brick as a building material, the result of which must redound to the advantage of the entire clay craft.

Respectfully submitted,
WARREN GRIFFISS, Baltimore, Md.
D. B. POTTER, Clarksburg, W. Va.
WM. WREFORD, Detroit, Mich.
A. R. D. JOHNSON, Raleigh, N. C.
FRED TALBOT, St. Louis, Mo.
LEVI MARSHALL, Horseheads, N. Y.
E. H. MICHELL, Salmen, La.
M. C. VIELE, North Adams, Mass.
JOSEPH MOULDING, Chicago, Ill.

J. Fred Smith: I move the adoption of the report.

John T. Hummert: I second the motion.

Motion carried.

Secretary Randall: Just a question of privilege, I want to introduce to the convention, Mr. Lawrence Koblitz, of the American Building Brick Company of this city, who has labored night and day for our entertainment. (Applause.) Incidentally, I should like to have him make any announcement for the ladies this afternoon or tomorrow.

Lawrence Koblitz: It has been very hard to arrange any of the details for entertainment for tomorrow, but this afternoon we are going to have in the library of the hotel a tea and card party at 3 o'clock for the ladies. There seems to have been some misunderstanding. We had engaged the lattice room, but we are just as well satisfied because the library is really a beautiful room, and we are pleased to have this entertainment there. We have been trying to take the ladies over the city in automobiles, and have been able to arrange for a number of little trips that the ladies seemed to enjoy, and if there are any of them here who have not been able to enjoy any of these little automobile trips, if they will let me know, I will arrange a trip for them. There will be a number of machines here from 2 to 3 o'clock for that special purpose. We have been very glad to have had the convention in our city, and if there is anything we can do for any of you, hope you will let us know. (Applause.)

Will P. Blair: I just want to remind the delegates that the Complete Building Show is still open. I have met two or three gentlemen, who came in late, who did not know there was such a show, and I want to announce that the show will be open until tomorrow night at 10:30.

Mr. Bryan: All I have to say is that they certainly are not very deeply interested in the association.

Secretary Randall: I think it would be well to have a meeting of the executive committee immediately following adjournment. It can be held right here in this room. I think we may all congratulate ourselves on the attendance at this convention. There is a change in the trend of convention work. I remember very distinctly that when the Illinois association and Ohio, Iowa and Indiana, too, had a convention with less than 150 members present, we thought the association was going to the dogs; that it was a failure; and when the attendance went below one hundred, we thought there was something radically wrong. I don't know whether it is the dropping out of the smaller manufacturers or the conditions that prevail generally, but it is a fact that these various state conventions are not attended as largely as they used to be. Illinois had a convention a couple of weeks ago, and they only had about fifty people there, and they had a good convention. The same thing was true in Iowa. It was held at Ames, at the home of their state college, and they only had about fifty in attendance. Now when we can have an attendance here at Cleveland something like 800, we can congratulate ourselves that the N. B. M. A. is not losing any of its virile force. There have been some elements in this convention rather puzzling, and I would like to have the members think it over. We have had the largest registration of members in the history of the association. We have given out over 800 badges, which, of course, includes the badges given the ladies, so we have had in attendance about 1,000. Incredible as it seems, there are always a goodly number of men who come to the conventions who never register at all. Yet with this attendance we have had the poorest attendance at our sessions we have ever had. If the executive committee can scheme up some manner by which we can get the members into our deliberative sessions, they will solve a problem. We have never had a better program than this week, and yet the speakers who have spent weeks in preparing their papers have come here and talked to empty chairs. Anyway, this has been true at the beginning of the sessions. Professor Orton had the only reasonable objection originally to coming to Cleveland. He objected to coming here originally because of the Exposition. He felt that the Exposition would detract rather than add to an educational proposition. I think he was right; so far as that was concerned, he is always right. However, I think we did right in coming here this year, but in the future we will weigh a little more carefully these considerations when deciding our meeting in connection with an exposition. It helps swell our attendance, but it does not help our convention work. These are matters for the executive committee and officers to wrestle with. We have had a splendid convention, everybody has enjoyed themselves, and I think we can well count the Cleveland convention a great success.

Mr. Eisenhart: I would be very much pleased to come back here next year; first, because the Cleveland people have treated us so nicely, and I want to give the Statler Hotel a fair chance; but if we are coming back here, I want to know it right now, so I can order my room.

Secretary Randall: We have very cordial invitations for our 1917 convention from a number of cities. They range from Providence, R. I., New York City, Atlantic City, Baltimore, St. Louis, Birmingham, Indianapolis, Minneapolis, to San Francisco.

Mr. Smith: What's the matter with Omaha? (Laughter.)

Secretary Randall: I take it for granted that the secretary will be authorized to acknowledge these letters and assure them that the executive committee will give each and all due consideration at the proper time.

Mr. Kane: I move that these letters be acknowledged and referred to the executive committee.

Mr. Brown: I second the motion.

Mr. Eisenhart: Put Horseheads down on that list. (Laughter.)

Mr. Kane: And Kushequa, too. (More laughter.)

Motion carried.

Mr. Mayer: I want to ask a question, and that is this:

Is Pittsburgh on that list? If not, I want to see that it maintains its record.

Mr. Hummert: If you want to get a good membership, come west once in a while. We western fellows have been going north and south and east, and I think it would be well to try and get a western city like Kansas City. We had a big convention at St. Louis. You will get some new members, and they will go to future conventions. I know we have been to Chicago, but let us go to the center of things.

Secretary Randall: I have been very glad to have members come to me and tell me they have enjoyed this session today and the pictures of brickyards; and the suggestion has been made that we have more illustrations of brick plants at future conventions. Mr. Hummert had some good pictures of his plant, but unfortunately it was a movie film and not slides, and we could not use them because we could not get a moving picture machine. If the members will go to the expense and trouble of making photographs of their plants, just as Mr. Johnson and others have done, it will add to our program. It is interesting for the members to know what is being done in the various parts of the country.

Professor Orton: Have you ever considered the feasibility of having a moving picture machine in connection with convention work?

Secretary Randall: We never have, because I have always thought it was too expensive.

Professor Orton: I do not mean to own it, but to rent it.

Secretary Randall: We wanted to rent one this year, but we could not because the laws of Cleveland will not allow a moving picture machine to be operated without a booth. I investigated that. I wanted to get a machine for Mr. Hummert's special benefit, but I found it would cost us $50.00 or more to place a booth and supply a lantern and operator.

President Deckman: If no one has anything further to offer for the good of the association, the convention will stand adjourned, to meet at such time and place as the executive committee may select. We would like to have the executive committee remain for a short session.

NUMERICAL ROSTER, N. B. M. A., CLEVELAND, 1916.

NAME. FIRM. TOWN.

1. M. W. BLAIR, Thornton Fire Brick Co., Thornton, W. Va.
2. E. H. MICHEL, Salmen Brick & Lbr. Co., Ltd., Slidell, La.
3. J. W. ROBB, Clinton Paving Brick Co., Clinton, Ind.
4. J. PARKER B. FISKE, Fiske & Co., Inc., New York, N. Y.
5. WILL P. BLAIR, Natl. Pav. Brick Mfrs. Assn., Cleveland, O.
6. A. F. GREAVES-WALKER, Sun Brk. Co., Toronto, Ont., Can.
7. JAMES E. RANDALL, The Clay-Worker, Indianapolis, Ind.
8. L. E. RODGERS, L. E. Rodgers Engineering Co., Zanesville, O.
9. W. D. RICHARDSON, Ceramic Sup. & Con. Co., Columbus, O.
10. ALFRED J. ROGERS, Fiske & Co., Inc., Boston, Mass.
11. THEO. A. RANDALL, Sec'y N. B. M. A., Indianapolis, Ind.
12. E. DeGROOT, The Standard Dry Kiln Co., Indianapolis, Ind.
13. A. R. ROOT, Chambers Bros. Co., Philadelphia, Pa.
14. G. A. WILD, Los Angeles Brick Co., Los Angeles, Cal.
15. K. E. ROCKHOLD, L. E. Rodgers Eng. Co., Zanesville, O.
16. ARTHUR JOHNSON, L. E. Rodgers Eng. Co., Zanesville, O.
17. HUGO LAYER, L. E. Rodgers Engineering Co., Zanesville, O.
18. C. T. HARRIS, Sec. Hollow Bldg. T. Mfrs. Assn., Cleveland, O.
19. C. C. BLAIR, Bessemer Limestone Co., Youngstown, O.
20. H. H. MacDONALD, Nat. Pav. B. Mfrs. Assn., Cleveland, O.
21. C. C. BARR, The Barr Clay Co., Streator, Ill.
22. JOTHAM POST, East Williston, N. Y.
23. G. B. MENTZ, G. B. Mentz Co., Walkill, N. Y.
24. PHILIP GOLDRICK, Saugerties, N. Y.
25. C. P. MAYER, Bridgeville, Pa.
26. W. A. MEDDICK, The Lakewood Engrg. Co., Cleveland, O.
27. CLAUD E. FULLER, Kansas City, Mo.
28. ROY G. SMITH, The Bonnot Co., Kansas City, Mo.
29. C. P. OUDIN, American Fire Brick Co., Spokane, Wash.
30. J. W. WORRALL, Mfrs.' Equipment Co., Dayton, O.
31. G. W. NUSHAW, Mfrs.' Equipment Co., Dayton, O.
32. J. T. UNDERWOOD, Mfrs.' Equipment Co., Dayton, O.
33. E. M. MAHLMEISTER, Mfrs.' Equipment Co., Dayton, O.
34. I. M. JUSTICE, Mfrs.' Equipment Co., Dayton, O.
35. JOHN L. SCHROLL, Mfrs.' Equipment Co., Dayton, O.
36. W. H. SACHS, Mfrs.' Equipment Co., Dayton, O.
37. J. C. HARRIS, Mfrs.' Equipment Co., Dayton, O.
38. FRANK McCLELLAN, Arnold-Creager Co., E. Cleveland, O.
39. HENRY C. BACH, Bach Brick Co., Chicago, Ill.
40. O. W. WILL, Roessler-Hasslacher Co., Perth Amboy, N. J.
41. EDWIN ZORN, Brick & Clay Record, Chicago, Ill.
42. F. B. DUNN, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
43. W. T. BLACKBURN, Dunn Wire-Cut-Lug Brick Co., Paris, Ill.
44. R. T. STULL, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
45. W. C. PERKINS, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
46. F. T. TOWNSEND, Dunn Wire-Cut-Lug B. Co., Conneaut, O.
47. H. G. LEHBACH, Dunn Wire-Cut-Lug B. Co., Conneaut, O.
48. F. A. CHURCHILL, Dunn Wire-Cut-Lug B. Co., Conneaut, O.
49. M. E. GREGORY, Brick, Tile & Terra C. Co., Corning, N. Y.
50. A. V. STURGEON, Nansemond River B. & T. Co., Suffolk, Va.
51. H. E. AVTICE, Cleveland, O.
52. DAVID B. GIBSON, Brick & Clay Record, Chicago, Ill.
53. H. H. ROSENBERG, Brick & Clay Record, Chicago, Ill.
54. F. W. DONAHOE, Brick & Clay Record, Chicago, Ill.
55. C. J. DECKMAN, Medal Paving Brick Co., Cleveland, O.
56. J. W. ANDERSON, Dodge Sales & Eng. Co., Mishawaka, Ind.
57. C. A. LANO, Borden Brick & Tile Co., Goldsboro, N. C.
58. B. E. PLACE, E. M. Freese & Co., Galion, O.
59. H. F. PLACE, E. M. Freese & Co., Galion, O.
60. G. C. STOLL, The Bonnot Co., Los Angeles, Cal.
61. W. C. MITCHELL, Seattle, Wash.
62. GEO. J. SCHWARZ, Ricketson & Schwarz, Milwaukee, Wis.
63. W. MALSCH, Roessler-Hasslacher Chem. Co., New York,N.Y.
64. W. SCHAPPER, Roessler-Hasslacher Ch. Co., New York,N.Y.
65. E. A. BROCKMAN, Roessler-Hasslacher Ch. Co., New York.
66. F. K. PENCE, American Encaustic Tiling Co., Zanesville, O.
67. WARREN GRIFFISS, Baltimore Brick Co., Baltimore, Md.
68. C. W. PARKER, Walsh Fire Clay Prod. Co., St. Louis, Mo.
69. N. D. DODD, Burton-Townsend Co., Zanesville, O.
70. HORACE F. CREW, Zanesville, O.
71. E. T. MONTGOMERY, N. Y. S. Schl. of Ceramics, Alfred,N.Y.
72. A. L. TERRY, Charles Engelhard, New York, N. Y.
73. R. W. NEWCOMB, Charles Engelhard, New York, N. Y.
74. J. W. SANDERS, United Stamping Co., Moundsville, W. Va.
75. CHAS. U. SPALLA, Rundle Mfg. Co., Milwaukee, Wis.
76. H. W. SMITH, Roessler-Hasslacher Chem. Co., New York,N.Y.
77. C. H. O'HARA, Roessler-Hasslacher Chem. Co., Cleveland, O.
78. SAMUEL RUSOFF, National Tile Co., Anderson, Ind.
79. C. O. ARBOGAST, Brick & Clay Record, Chicago, Ill.
80. L. R. OFFICE, Columbus, O.
81. H. C. GINN, Penn. Fire Proofing Co., Erie, Pa.
82. A. F. HOTTINGER, No'western Terra Cotta Co., Chicago, Ill.
83. ELLIS LOVEJOY, Columbus, O.
84. C. B. THWING, Thwing Instrument Co., Philadelphia, Pa.
85. J. W. LAZEAR, Brown Instrument Co., Chicago, Ill.
86. G. L. CLAPPER, Brown Instrument Co., Pittsburgh, Pa.
87. R. J. FUNK, Brown Instrument Co., Pittsburgh, Pa.
88. J. P. GOHEEN, Brown Instrument Co., Philadelphia, Pa.
89. E. F. DECKERT, Main Belting Co., Louisville, Ky.
90. G. A. ANDERSON, The J. D. Fate Co., Plymouth, O.
91. J. B. WILCOX, The Alliance Clay Product Co., Alliance, O.
92. J. G. BARBOUR, Metropolitan Brick Co., Canton, O.
93. ED. W. DOW, E. M. Freese & Co., Pittsburgh, Pa.
94. C. STEADMAN, Steadman & Robinson, New York City.
95. H. WIRSCHING, Standard Dry Kiln Co., Dayton, O.
96. C. A. NICELY, Watsontown Brick Co., Watsontown, Pa.
97. N. B. DAVIS, Canadian Dept. of Mines, Ottawa, Canada.
98. F. H. EGGERS, Cleveland, O.
99. H. C. WHITMORE, C. B. Whitmore Co., Lockport, N. Y.
100. G. S. BRUBAKER, H. Brewer & Co., Peru, Ind.
102. H. FORESTER, Veritas Firing System Co., Cleveland, O.
103. W. H. MERKEL, American Clay Machy. Co., Bucyrus, O.
104. H. C. PENFIELD, American Clay Machy. Co., Bucyrus, O.
105. N. T. BANNIGAN, McQuade & Bannigan, Utica, N. Y.
106. M. N. MORROW, Hocking Valley Brick Co., Columbus, O.
107. W. P. BARNHART, Jr., Medal Paving B. Co., Wooster, O.
108. H. C. MOATS, Medal Paving Brick Co., Wooster, O.
109. J. L. MURPHY, Hocking Valley Brick Co., Nelsonville, O.
110. P. D. HELM, Columbus, O.
111. FRANCES E. PRESTON, Dover Fire B. Co., Cleveland, O.
112. H. L. LANGENECKER, Dayton, O.
113. H. C. KENYON, Standard Brick Co., Charleston, W. Va.
114. L. B. KOBLITZ, American Building Brick Co., Cleveland, O.
115. R. G. FERGUSON, Clarage Fan Co., Kalamazoo, Mich.
116. S. I. DAVIS, American Building Brick Co., Cleveland, O.
117. M. S. KOBLITZ, American Building Brick Co., Cleveland, O.
118. H. D. KOBLITZ, American Building Brick Co., Cleveland, O.
119. J. F. LEONARD, Cuyahoga Bldg. Supply Co., Cleveland, O.
120. W. H. GIFFORD, Cleveland Builders Supply Co., Cleveland, O.
122. L. K. BROWN, Burton Townsend Co., Zanesville, O.
123. GEORGE W. SHOEMAKER, Columbus, O.
124. G. P. FISHER, National Fireproofing Co., Pittsburgh, Pa.
125. H. A. HALL, Hocking Valley Brick Co., Logan, O.
126. L. J. SHERIDAN, Brick & Clay Record, Cleveland, O.
127. PALMER HELPMAN, American Architect, Cleveland, O.
128. H. A. SMYTH, Wisconsin Brick Co., Madison, Wis.
129. L. C. WILHOFF, Youngstown Steel Car Co., Youngstown, O.
130. R. W. TAYLOR, Canton Stamping Co., Canton, O.
131. R. D.LANDRUM, Harshaw, Fuller & Goodwin Co., Cleveland.
132. JAMES L. JENSEN, Empire China Works, Brooklyn, N. Y.
133. A. V. BLEININGER, Bureau of Standards, Pittsburgh, Pa.
134. HENRY F. KREIG, Midland Terra Cotta Co., Chicago, Ill.
135. HOMER F. STALEY, Iowa State College, Ames, Ia.
136. AMOS P. POTTS, Mason City Brick & T. Co., Mason City, Ia.
137. S. HARRY NORTH, Penn. Feldspar Co., Philadelphia, Pa.
138. G. GEUDER, Geuder-Paschke & Grey Co., Milwaukee, Wis.
139. A. SILVERMAN, University of Pittsburgh, Pittsburgh, Pa.
140. FRED BERNARD, Hinde Brick & Tile Co., Sandusky, O.

141. STEPHEN KOLLER, Ochs & Frey Brick Co., Allentown, Pa.
142. OSCAR OCHS, Ochs & Frey Brick Co., Allentown, Pa.
143. HENRY W. DONAA, Pittsburgh, Pa.
144. FRED TALBOT, Laclede Christy Co., St. Louis, Mo.
145. F. G. MATTESON, Purington Paving B. Co., Galesburg, Ill.
146. JOS. B. SHAW, Pittsburgh Brick Co., Pittsburgh, Pa.
147. W. H. GREER, The Greer Beaty Clay Co., Magnolia, O.
148. D. B. POTTER, Thornton Fire Brick Co., Clarksburg, W. Va.
149. G. R. TRUMAN, St. Louis Terra Cotta Co., St. Louis, Mo.
150. E. W. KINGSBURY, Scandinavian Belting Co., Cleveland, O.
151. J. W. CUSHING, Scandinavian Belting Co., Chicago, Ill.
152. J. H. RESIDE, Scandinavian Belting Co., Cleveland. O.
153. H. S. RENKERT, Metropolitan Paving B. Co., Canton, O.
154. J. M. HALLISY, Scandinavian Belting Co., Columbus, O.
155. J. K. LUTZ, Scandinavian Belting Co., Cleveland, O.
156. L. S. SCOTT, Scandinavian Belting Co., Cleveland, O.
157. L. W. PENFIELD, American Clay Mach. Co., Willoughby, O.
158. L. HAIGH, American Clay Machinery Co., Bucyrus, O.
159. F. L. HOPLEY, American Clay Machinery Co., Bucyrus, O.
160. W. A. DENMEAD, General Electric Co., Schenectady, N. Y.
161. WM. GEDDES, Denver Sewer Pipe Co., Denver, Col.
162. H. COPPING, Philadelphia Textile Mach. Co., Kankakee, Ill.
163. M. L. BELL, Wilkensburg, Pa.
164. R. H. H. PIERCE, Harbison-Walker Refrac. Co., Pittsburgh.
165. C. W. DENISTON, United Brick Co., Greensburg, Pa.
166. F. L. STOWELL, Sterling Brick Co., Olean, N. Y.
167. CHARLES F. BINNS, N. Y. State University, Alfred, N. Y.
168. R. R. HICE, State Geologist, Beaver, Pa.
169. E. E. F. CREIGHTON, General Elec. Co., Schenectady, N. Y.
170. R. L. CLARE, Federal Terra Cotta Co., Woodbridge, N. J.
171. R. A. SHIPLEY, Neodesha, Kans.
172. SEIJI KONDO, Columbus, O.
173. C. W. BERRY, Laclede Christy Co., St. Louis, Mo.
174. EARL M. TILTON, State Highway Dept., Columbus, O.
175. JOSEPH A. MARTZ, Greenville, O.
176. FRED A. MORGAN, Picher Lead Co., Chicago, Ill.
177. B. S. PURINGTON, E. Liverpool Potteries Co., E. Liverpool, O.
178. R. W. GREENE, Kentucky Con. & Imp. Co., Mayfield, Ky.
179. EDWARD ORTON, Ohio State University, Columbus, O.
180. EDWARD C. STOVER, Trenton Potteries Co., Trenton, N. J.
181. CHAS. G. DECKMAN, Medal Paving Brick Co., Cleveland, O.
182. D. D. DEEDS, Thew Automatic Shovel Co., Lorain, O.
183. R. C. BENNETT, Wellington Mach. Co., Wellington, O.
184. C. G. STEVENSON, The Stevenson Co., Wellsville, O.
185. THOMAS A. HIBBINS, The Stevenson Co., Wellsville, O.
186. R. D. McMANIGAL, McManigal Grateless Fur. Co., Logan, O.
187. EBEN RODGERS, Alton Brick Co., Alton, Ill.
188. WILLIAM T. BUSSELL, Brazil, Ind.
189. B. W. BALLOU, Kansas Buff Brick Mfg. Co., Buffville, Kans.
190. ED. J. SHAW, American Clay Machinery Co., Bucyrus, O.
191. H. B. HENDERSON, Columbus, O.
192. W. S. STOUT, Ohio State Geological Survey, Columbus, O.
193. J. W. WARD, Pittsburgh High Volt. Insulator Co., Derry, Pa.
194. CHAS. F. KOCH, National Sales Co., Cincinnati, O.
195. M. C. VIELE, North Adams Brick Co., North Adams, Mass.
196. ED. POSTON, Martinsville Brick Co., Martinsville, Ind.
197. GEO. J. POTTS, C. & A. Potts Co., Indianapolis, Ind.
198. H. C. ARNOLD, Ceramic Supply & Cons. Co., Columbus, O.
199. PAUL TEETOR, Kansas Geological Survey, Lawrence, Kans.
200. H. H. OBERLY, James B. Oberly, Wilmington, Del.
201. B. J. GALLAGHER, Veedersburg Paver Co., Veedersburg, Ind.
202. E. W. CONLEY, Bradford Pressed Brick Co., Bradford, Pa.
203. JAMES R. THOMAS, Standard Brick Co., Crawfordsville, Ind.
204. E. A. BOOTH, Main Belting Co., Buffalo, N. Y.
205. ROSS C. PURDY, Norton Co., Worcester, Mass.
206. W. D. GATES, American Terra Cotta & Ceramic Co., Chicago.
207. J. FRED SMITH, Smith Brick Co., Omaha, Neb.
208. WM. H. CRANGLE, Medal Paving Brick Co., Cleveland, O.
209. F. L. MANNING, Peebles Paving Brick Co., Portsmouth, O.
210. H. J. VOTAW, The J. D. Fate Co., Chicago, Ill.
211. H. H. FATE, The J. D. Fate Co., Plymouth, O.
212. GEO. FRID BRICK CO., Hamilton, O.
213. W. H. GIFFORD, Cleveland Builders Supply Co., Cleveland, O.
214. L. MARSHALL, Jr., Consolidated Brick Co., Horseheads, N. Y.
215. W. T. LECHTENBERG, Lechtenberg Bros., Quincy, Ill.
216. R. C. PENFIELD, American Clay Mach. Co., New York, N. Y.
217. H. S. SIMPSON, American Clay Mach. Co., Chicago, Ill.
218. R. O. PERROTT, American Clay Mach. Co., Bucyrus, O.
219. C. B. SHARER, American Clay Mach. Co., Bucyrus, O.
220. DAVIS BROWN, American Clay Mich. Co., Bucyrus, O.
221. JAMES P. MARTIN, American Clay Mach. Co., Bucyrus, O.
222. HOLLIS B. CRUM, American Clay Mach. Co., Chicago, Ill.
223. W. R. CUNNINGHAM, American Clay Mach. Co., Bucyrus, O.
224. W. T. ROSSITOR, Cleveland Builders Sup. Co., Cleveland, O.
225. JOHN KEOUGH, Cleveland Builders Supply Co., Cleveland, O.
226. JOHN T. HUMMERT, Gem City Press Brick Co., Quincy, Ill.
227. WM. HANLEY, Bradford Pressed Brick Co., Meadford, Pa.
228. H. S. HAMILTON, The McArthur Brick Co., McArthur, O.
229. L. W. SPRAGUE, The McArthur Brick Co., McArthur, O.
230. C. C. COLEMAN, Adams Clay Prod. Co., Martinsville, Ind.
231. L. D. BINYON, S. S. Kimbell Brick Co., Chicago, Ill.
232. JAMES A. HOGAN, S. S. Kimbell Brick Co., Chicago, Ill.
233. E. J. SCHARIO, Keim Brick Co., Louisville, O.
234. R. R. COLBURN, Colburn-Murray Brick Co., Minneapolis.
235. T. J. MURRAY, Colburn-Murray Brick Co.
236. G. T. ANDERSON, Wisconsin Lime & Cement Co., Chicago.
237. R. D. T. HOLLOWELL, American Face Brick Co., Pittsburgh.
238. H. S. McMILLAN, Porcelian Enameling & Mfg. Co., Detroit.
239. F. H. VAN DERBECK, Hewitt Rubber Co., Buffalo, N. Y.
240. W. REECE, Hewitt Rubber Co., Buffalo, N. Y.
241. WILL H. MILLER. The Dunn Brick Works, Erie, Pa.
242. A. P. DOUGHERTY, Ohio Galvanizing & Mfg. Co., Niles, O.
243. A. J. BENTLEY, Ohio Galvanizing & Mfg. Co., Niles, O.
244. R. F. KUMLER, Mathews Gravity Carrier Co., Cleveland, O.
245. J. A. PARADINE, J. A. Paradine Co., Erie. Pa.
246. J. TERRY, Terry Bros. Co., Kingston, N. Y.
247. E. L. HESS, E. M. Freese & Co., Galion, O.
248. A. J. FREESE, E. M. Freese & Co., Galion, O.
249. MASON CHILCOTE, Ohio State Brick Plant, Junction City, O.
250. J. S. McCANN, Streator Clay Mfg. Co., Streator, Ill.
251. B. F. DEARDOFF, Muncie, Ind.
252. M. C. GREGORY, Brick, Terra Cotta & Tile Co., Corning, N. Y.
253. M. GANGER, Face Brick Exhibit, Cleveland, O.
254. B. L. DAVIDSON, Face Brick Exhibit, Cleveland, O.
255. D. EARL CHILD, The Hancock Brick & Tile Co., Findlay, O.
256. HENRY PLEINES, The Lakewood Eng. Co., Cleveland, O.
257. J. G. BENEDICT, The Lakewood Eng. Co., Cleveland, O.
258. R. W. TONZEAU, The Lakewood Eng. Co., Cleveland, O.
259. C. F. LANG, The Lakewood Eng. Co., Cleveland, O.
260. L. R. WILSON, The Lakewood Eng. Co., Cleveland, O.
261. J. V. MOSEL, The Lakewood Eng. Co., Cleveland, O.
262. H. S. SWINEHART, Chase Fdy. & Mach. Co., Columbus, O.
263. S. C. PEEBLES, Peebles Paving Brick Co., Portsmouth, O.
264. C. W. FINNEY, The Peebles Paving Brick Co., Portsmouth, O.
265. G. D. DALTON. Dalton Bros. Brick Co., Hopkinsville, Ky.
266. A. J. DUNN, Chase Fdy. & Mfg. Co., Columbus, O.
267. GEO. H. GANSON, Dover Fire Brick Co.
268. M. N. KIMBELL, Kimbell-Hill Brick Co., Chicago, Ill.
269. C. J. HILL, Kimbell-Hill Brick Co., Chicago, Ill.
270. EDMUND C. CARR, Jr., Metropolitan Brick Co., Cleveland, O.
271. J. C. KLINE, John Kline Brick Co., Wickliffe, O.
272. F. E. SCHULTZ, The Medal Paving Brick Co., Wooster, O.
273. D. A. CABLE, U. S. Roofing Tile Co., Parkersburg, W. Va.
274. H. A. FORD, Medal Paving Brick Co., Cleveland, O.
275. RAY HOOVER, Keim Brick Co., Osnaburg, O.
276. D. C. WILCOX, Alliance Clay Products Co., Alliance, O.
277. OATES WILCOX, Alliance Clay Products Co., Alliance, O.
278. D. E. HUMPHREY, Medal Paving Brick Co., Cleveland, O.
279. R. E. ANDERSON, Ohio State University, Columbus, O.
280. P. G. LARKIN, Denver Terra Cotta Co., Denver, Col.
281. J. B. BLEWETT, Ohio State University, Columbus, O.
282. E. B. AYRES, Phila. Textile Machinery Co., Philadelphia, Pa.
283. R. O. KEISER, Phila. Textile Machinery Co., Philadelphia, Pa.
284. W. F. SOISSON, Jos. Siosson Fire Brick Co., Connellsville, Pa.
285. H. D. DRAKE, H. D. Drake & Co., Windsor, Ont., Can.
286. J. M. HIGHHOUSE, Hydraulic Press Brick Co., Toledo, O.
287. LESTER H. KEIM, R. D. Nuttall Co., Pittsburgh, Pa.
288. F. H. CHAPIN, Hydraulic Press Brick Co., Cleveland, O.
289. F. SHENKLE, Federal Clay Products Co., Mineral City, O.
290. E. P. FOSTER, Bessemer Limestone Co., Youngstown, O.
291. D. H. NICHOLS, Rock Products & Bldg. Material, Chicago.
292. JOHN F. BROOKS, Brooks Construction Co., Ft. Wayne, Ind.
293. W. J. WHITWORTH, Bessemer Limestone Co., Youngstown.
294. JOHN E. SCHUESLER, Buffalo, N. Y.
295. HENRY BENDER, Buffalo, N. Y.
296. F. B. GODLEY, Engineering News, New York, N. Y.
297. L. R. MACKENZIE, Aspha Bric Co., Chicago, Ill.
298. THEO. C. JACOBY, Aspha Bric Co., Kirkwood, Mo.
299. WALTER L. HEMPLEMAN, John Baker, Jr., Chicago, Ill.
300. C. F. HEPBURN, John Baker, Jr., Chicago, Ill.
301. W. A. BAILEY, Northampton Brick Co., Northampton, Mass.
302. JOHN W. REAGAN, Knoxville Brick Co., Knoxville, Tenn.
303. ARTHUR S. WATTS, Ohio State University, Columbus, O.
304. CARL B. HARROP, Ohio State University, Columbus, O.
305. G. O. KALBFLEISCH, Standard San. Mfg. Co., Tiffin, O.
306. C. H. MUCKENHIRN, Standard San. Mfg. Co., Detroit, Mich.
307. W. CROW, Schaffer Eng. & Equip. Co., Tiffin, O.
308. E. C. HILL, N. Y. Arch. Terra Cotta Co., New York, N. Y.
309. A. A. OLDHAM, The Bonnot Co., Canton, O.
310. H. A. CARTER, The Bonnot Co., Canton, O.
311. A. E. WILLIAMS, University of Illinois, Urbana, Ill.
312. JACOB J. JACOBS, The Ohio Brick Co., Toledo, O.
313. GEORGE M. KRICK, Krick, Tyndall & Co., Decatur, Ind.
314. E. STEVENS, Bippus Tile Co., Bippus, Ind.
315. R. E. THOMPSON, Columbus, O.
316. W. P. FREY, Cleveland, O.
317. F. J. JACOBS, Ohio Brick Co., Cleveland, O.
318. H. E. COVAN, Price Pyrometer Co., Cleveland, O.
319. O. W. RENKERT, Metropolitan Brick Co., Canton, O.
320. H. I. RISELING, Metropolitan Brick Co., Canton, O.
321. M. J. STONE, Metropolitan Brick Co., Canton, O.
322. H. D. BARGER, Metropolitan Brick Co., Canton, O.
323. P. V. WHEELER, Link Belt Co., Philadelphia, Pa.
324. P. A. SMITH, The A. F. Smith Co., New Brighton, Pa.
325. R. J. MONTGOMERY, H. Koppers Co., Pittsburgh, Pa.
326. C. E. FULTON, Pittsburgh Plate Glass Co., Tarentum, Pa.
327. JOHN A. MILLER, Rochester Clay Prod. Co., Rochester, Pa.
328. W. J. STEPHANI, O. W. Ketcham, T. C. Wks., Philadelphia.
329. SPENCER M. DUTY, Medal Paving Brick Co., Cleveland, O.
330. W. O. FREDENBURG, Fredenburg & Lounsbury, New York.
331. C. FORREST TEFFT, Fiske & Co., Darlington, Pa.
332. T. W. RICHARDSON, Fiske & Co., Ridgway, Pa.
333. FRANCIS T. OWENS, Fiske & Co., Ridgway, Pa.
334. FRED R. WILLIAMS, N. P. B. M. A., Cleveland, O.
335. G. H. REITER, Illinois Pav. Brick Pub. Bureau, Chicago, Ill.
336. J. HOWARD CHAMBERS, Chambers Bros. Co., Philadelphia.
337. W. H. BUNCE, Kane Brick Co., Kane, Pa.
338. R. J. DAWSON, Cuyahoga Brick & Shale Co., Cleveland, O.
339. JOS. H. RUBY, Cuyahoga Brick & Shale Co., Cleveland, O.
340. J. A. BLAIR, Kushequa Brick Co., Kushequa, Pa.

341. M. B. GREENOUGH, Case School Applied Science, Cleveland.
342. W. E. VODREY, Vodrey Pottery Co., East Liverpool, O.
343. SAMUEL B. LARKINS, National China Co., Salineville, O.
344. R. A. YOUNG, Marion Mach., Fdy. & Supply Co., Marion, Ind.
345. M. McFEELY, Marion Mach., Fdy. & Supply Co., Marion, Ind.
346. ED. FLANDERS, The Marietta Shale Brick Co., Marietta, O.
347. E. H. FLANDERS, Marietta Shale Brick Co., Marietta, O.
348. D. J. STRICKLAND, Wellington Machine Co., Wellington, O.
349. O. G. KNOSKE, The Alliance Brick Co., Alliance, O.
350. LEO A. KRUEGER, Cuyahoga Building Supply Co., Cleveland.
351. I. ANDREW KRUSON, Locke Insulator Co., Victor, N. Y.
352. F. R. KANENGEISER, Bessemer Limestone Co., Bessemer, Pa.
353. A. J. AUBREY, Bessemer Limestone Co., Youngstown, O.
354. HERBERT N. ANDERSON, The Brickmaker, Pittsburgh, Pa.
355. GEORGE O. BERRY, Columbus, Ga.
356. J. R. ROWLAND, Bessemer Limestone Co., Youngstown, O.
357. IRA P. JONES, W. G. Bush & Co., Nashville, Tenn.
358. A. W. KELSE, The Medal Paving Brick Co., Cleveland, O.
359. E. C. HOWARD, Claycraft Brick Co., Columbus, O.
360. J. W. SIBLEY, So. Pav. Brick Mfrs. Assn., Birmingham, Ala.
361. J. LEO CHILD, Hancock Brick & Tile Co., Findlay, O.
362. DOUGLAS F. STEVENS, Acme Brick Co., Cayuga, Ind.
363. JOHN H. QUALMAN, Saginaw Pav. Brk. Co., Saginaw, Mich.
364. CHAS. H. KEPLER, Saginaw Pav. Brick Co., Saginaw, Mich.
365. A. R. D. JOHNSON, Cherokee Brick Co., Raleigh, N. C.
366. G. H. CLIPPERT, G. H. Clippert & Bro. Brk. Co., Detroit.
367. C. H. BRYAN, Mercier-Bryan-Larkins Co., Detroit, Mich.
368. WM. CLIPPERT, Detroit, Mich.
369. JOHN S. HAGGERTY, John S. Haggerty Co., Detroit, Mich.
370. W. B. WREFORD, Detroit Brk. Mfrs. & Dirs. Assn., Detroit.
371. JAS. P. WILLIAMS, Consulting Engineer, St. Louis, Mo.
372. D. WARREN DeROSAY, Corry Brick & Tile Co., Corry, Pa.
373. G. B. LUCKETT, Crawf. Shale Brk. Co., Crawfordsville, Ind.
374. F. H. ROBINSON, Lakewood Eng. Co., Pittsburgh, Pa.
375. W. J. SNYDER, Brazil, Ind.
376. CHAS. A. HILL, Brazil Clay Co., Brazil, Ind.
377. H. G. WHITEMORE, Roch. Ger. Brk. & T. Co., Rochester,N.Y.
378. GEO. J. WALTER, Chatsworth, Ill.
379. H. C. PODOLSKY, Bonner & Marshall Brk. Co., Chicago.
380. C. H. BONNER, Bonner & Marshall Brk. Co., Chicago, Ill.
381. GEO. A. BILQUE, Gloninger & Co., Pittsburgh, Pa.
382. CHAS. F. HERRMAN, U. S. Brick Co., Tell City, Ind.
383. C. C. MURRAY, Reynoldsville B. & T. Co., Reynoldsville, Pa.
384. R. O. COSLER, Hay-Walker Brick Co., Pittsburgh, Pa.
385. F. B. HOLMES, F. B. Holmes & Co., Detroit, Mich.
386. W. H. FRINK, The Frink Pyrometer Co., Lancaster, O.
387. R. G. EISENHART, Cons. Brick Co., Horseheads, N. Y.
388. F. J. FRINK, Frink Pyrometer Co., Lancaster, O.
389. G. B. FORD, Conkling-Armstrong T. C. Co., Philadelphia, Pa.
390. G. W. GURNEY, Alliance Clay Products Co., Alliance, O.
391. J. H. BURSON, Alliance Clay Products Co., Alliance, O.
392. H. J. FLOOD, Chisholm, Boyd & White Co., Chicago, Ill.
393. L. W. FLOOD, Chisholm, Boyd & White Co., Chicago, Ill.
394. H. W. MOORE, Atlantic Terra Cotta Co., Tottenville, N. Y.
395. H. FROST, Los Angeles Pr. Brk. Co., Los Angeles, Cal.
396. GUS LARSON, Los Angeles Pr. Brk. Co., Los Angeles, Cal.
397. C. W. RAYMOND, Intl. Clay Mach. Co., Dayton, O.
398. J. F. KREHBIEL, Advance Terra Cotta Co., Chicago, Ill.
399. A. GOODEY, Consolidated Brick Co., Horseheads, N. Y.
400. FRANK MASS, Consolidated Brick Co., Horseheads, N. Y.
401. H. P. JENKS, Hook Patent Kiln Co., Vigo, O.
402. D. C. HAEGER, Haeger Brick & Tile Co., Aurora, Ill.
403. C. H. BRAY, Western Clay Mfg. Co., Helena, Mont.
404. J. E. WILTSHIRE, Ohio Kiln Co., Vigo, O.
405. C. HOOK, Ohio Kiln Co., Vigo, O.
406. J. W. VAN WERT, A. B. Meyer & Co., Indianapolis, Ind.
407. L. AULMANN, Eagle Iron Works, Des Moines, Ia.
408. WM. BURGESS, Toronto, Ont., Can.
409. T. M. WILSON, Brick & Clay Eng. Co., Philadelphia, Pa.
410. R. P. STODDARD, S. A. F. E., Cleveland. O.
411. C. A. GARDNER, American Enamel Brk. Co., New York City.
412. C. B. CRAWFORD, Steubenville, O.
413. C. M. CROOK, Tidewater Pav. Brk. Co., Catskill, N. Y.
414. W. H. ARTZ, Westinghouse Elec. & Mfg. Co., E. Pittsburgh.
415. L. B. COULTER, Carborundum Co., Niagara Falls, N. Y.
416. M. STANGLE, Haeger Brick & Tile Co., Dundee, Ill.
417. J. C. FOWLER, Paxton Brick Co., Middleburg, Pa.
418. W. E. FOWLER, Paxton Brick Co., Middleburg, Pa.
419. T. H. SANT, The John Sant & Son Co., E. Liverpool, O.
420. D. McKEEVER, New Lexington Clay Mfg. Co., Columbus, O.
421. D. K. THOMPSON, JR., Thompson-Armstrong Co., Cincinnati.
422. R. A. BROWN, The Taggart & Brown Co., Springfield, O.
423. W. W. DICKINSON, JR., Arkansas B. & M. Co., Little Rock.
424. J. M. STONER, Cincinnati Clay Prod. & Sup. Co., Cincinnati.
425. W. PURSELL, The Pursell-Grand Co., Cincinnati, O.
426. E. F. GRAND, The Pursell-Grand Co., Cincinnati, O.
427. H. R. BEEGLE, Beaver Clay Mfg. Co., New Galilee, Pa.
428. J. G. LITTLE, Beaver Clay Mfg. Co., New Galilee, Pa.
429. C. G. SNYDER, McDonald Coal & Brick Co., Detroit, Mich.
430. E. J. REAL, National Roofing Tile Co., Lima, O.
431. G. W. FOSTER, JR., Kittanning Cl. Prod. Co., Kittanning, Pa.
432. E. L. MITCHELL, Mitchell Brick Co., Cincinnati, O.
433. C. E. FOSTER, Bradford, Pa.
434. G. W. FOSTER, Kittanning Clay Prod. Co., Bradford, Pa.
435. J. S. McCANNELL, Milton Pressed Brick Co., Milton, Ont.
436. W. O. LITTLE, Beighlee Elect. Co., New York City.
437. W. H. CHAPPELL, The Beighlee Elect. Co., Cleveland, O.
438. H. C. DOWNERD, Malvern Fire Clay Co., Malvern, O.
439. O. T. WETTER, Metropolitan Paving Brick Co., Canton, O.
440. O. H. WILSON, Metropolitan Brick Co., Canton, O.
441. A. L. CURRY, Metropolitan Paving Brick Co., Canton, O.
442. W. M. HODGES, Tuna Valley Pr. Brk. Co., Bradford, Pa.
443. C. L. STONER, Ohio Pav. Brick Mfrs. Assn., Canton, O.
444. J. M. POWELL, Indiana Drain Tile Co., Brooklyn, Ind.
445. ASTRID S. ROSING, Chicago, Ill.
446. IRA E. SPROAT, Bureau of Mines, Washington, D. C.
447. W. T. KERSHNER, Sanderson Cyclone Drill Co., Orrville, O.
448. H. R. SYKES, The J. D. Fate Co., Plymouth, O.
449. G. B. DRENNAN, The J. D. Fate Co., Plymouth, O.
450. H. B. WELLS, Belden Brick Co., Canton, O.
451. E. P. OGDEN, Scott Brick Proc. Co., Knoxville, Tenn.
452. WM. CHANNEL, Melvin Brick & Tile Co., Melvin, O.
453. F. S. HALE, Vigo-Amer. Clay Co., Terre Haute, Ind.
454. A. WEISKETTEL, A. Weiskettel & Sons, Baltimore, Md.
455. G. T. DICKOVER, G. T. Dickover & Son, Wilkesbarre, Pa.
456. HENRY A. KOESTER, Student, Norwalk, O.
457. G. C. KEITH, Toronto, Ont., Can.
458. R. W. SHARER, Big Four Clay Co., Malvern, O.
459. L. L. DENNISON, Delaware Clay Mfg. Co., Delaware, O.
460. L. DENNISON, JR., Delaware Clay Mfg. Co., Delaware, O.
461. E. J. MELLEN, Cleveland Alloys Co., Cleveland, O.
462. B. BIGSBY, JR., Cleveland Alloys Co., Cleveland, O.
463. A. G. GREGORY, Calumet Supply Co., Gary, Ind.
464. WM. CONWAY, JR., Philadelphia, Pa.
465. JOS. T. BYRNE, Jos. Byrne Est., Philadelphia, Pa.
466. O. K. WEST, Imperial Belting Co., Columbus, O.
467. W. A. HOWELL, Collingwood Brick Co., Toledo, O.
468. A. R. KUHLMAN, Ohio Brick Co., Toledo, O.
469. A. PETIT, Chestnut Ridge Wh. Brk. Co., New York, N. Y.
470. J. S. PHELAN, St. Law. Br. Co., Ltd., Montreal, Que., Can.
471. B. H. RICHARDS, JR., Richards Brk. Co., Edwardsville, Ill.
472. H. H. FREESE, E. M. Freese & Co., Galion, O.
473. F. A. FLEMING, The Chase Fdry. & Mfg. Co., Columbus, O.
474. H. S. SWINEHART, Chase Fdry. & Mfg. Co., Columbus, O.
475. T. P. STILLWAGON, Stor. Trans. & Sup. Co., Warren, O.
476. B. S. FISHER, Col. Brick & Terra Co., Union Furnace, O.
477. A. K. KRAMMER, Mfrs.' Equipment Co., Dayton, O.
478. A. O. DUPUY, C. O. Bartlett & Snow Co., Cleveland, O.
479. J. A. DOLBEN, Dolben & Co., Boston, Mass.
480. A. S. REID, A. S. Reid & Co., Philadelphia, Pa.
481. C. E. JACQUART, Amer. Enam. Brk. & T. Co., S. River, N. J.
482. J. F. BOOREAM, Am. En. Br. & T. Co., New York, N. Y.
483. G. V. CATHEY, Dresden Brick Co., Detroit, Mich.
484. RALPH SPENCER, Dresden Brick Co., Detroit, Mich.
485. A. K. KINLEY, National Belting Co., Cleveland, O.
486. JOHN CARR, Dresden Brick Co., Detroit, Mich.
487. J. F. FISHER, Medal Paving Brick Co., Malvern, O.
488. H. H. SMITH, Medal Paving Brick Co., Conneaut, O.
489. C. O. EVANS, Warren Brick & Tile Wks., Warren, Mich.
490. W. E. FONDA, Cleveland, O.
491. A. F. UNCKRICK, City Eng., Galion, O.
492. J. H. SHIELDS, Cleveland, O.
493. F. J. McDONALD, J. C. McDonald & Son, Detroit, Mich.
494. C. J. McDONALD, McDonald Coal & Br. Co., Detroit, Mich.
495. J. P. STILLWAUGH, Medina Shale Br. Co., Ltd., Toronto.
496. W. C. MILLER, Wash. Br. & T. C. Co., Washington, D. C.
497. S. P. STILLWAUGH, Medina Sh. Br. Co., Ltd., Toronto, Can.
498. R. M. BERTRAM, Medina Shale Brick Co., Toronto, Ont.
499. E. D. McGRAW, East Palestine, O.
500. B. W. BROCKETT, Detroit, Mich.
501. A. H. WEHRINGER, Ottawa Tile Co., Ottawa, O.
502. L. W. HARSTON, Atlas Car. & Mfg. Co., Cleveland, O.
503. B. F. WEYBRECHT, Alliance Clay Prod. Co., Alliance, O.
504. C. A. CASE, Burton-Townsend Brick Co., Zanesville, O.
505. A. L. HENDERSHOT, Cleveland Br. & Clay Co., Cleveland, O.
506. C. U. HENDERSHOT, Cleve. Br. & Clay Co., Cleveland, O.
507. D. A. ROSS, U. S. Bu. of Stand., Pittsburgh, Pa.
508. E. A. ROBERTS, Builders Exchange, Cleveland, O.
509. C. R. VAN ORMER, Pittsburgh Callery Br. Co., Pittsburgh.
510. T .P. CUTHBERT, Fallston Fire Clay Co., Pittsburgh, Pa.
511. A. F. HUMPHREYS, Fallston Fire Clay Co., Beaver, Pa.
512. WM. DRAYTON, Fallston Fire Clay Co., Beaver, Pa.
513. ELMER E. MILLER, Canton Grate Co., Canton, O.
514. W. J. DEGENHART, J. H. Black Co., Buffalo, N. Y.
515. J. H. BLACK, J. H. Black Co., Buffalo, N. Y.
516. H. S. LANGWORTHY, Jewettville Br. Co., Orchard Park,N.Y.
517. E. G. FINZER, Finzer Bros. Clay Co., Sugar Creek, O.
518. W. S. FINZER, Finzer Bros., Sugar Creek, O.
519. C. T. HANNA, Hay-Walker Brick Co., Pittsburgh, Pa.
520. E. E. McCOY, Hay-Walker Brick Co., Pittsburgh, Pa.
521. H. S. BENNETT, Wellington Machinery Co., Wellington, O.
522. G. E. DERRY, Tregillus Clay Prod. Co., Calgary, Ont., Can.
523. G. W. OGAN, Herkimer, N. Y.
524. JOHN MAJOR, The Phil. Brick Co., Philadelphia, Pa.
525. WM. LYON, Wm. Lyon & Son, Herkimer, N. Y.
526. ELISHA K. KANE, Kushequa Keramic Co., Kushequa, Pa.
527. WM. B. CANE, American Bldg. Brick Co., Cleveland, O.
528. GEO. S. DAVIES, Hydraulic Press Brick Co., Cleveland, O.
529. JOHN HARMS, John Harms Co., Cleveland, O.
530. G. R. HESS, E. M. Freese & Co., Galion, O.
531. J. F. McLAUGHLIN, Beighlee Electric Co., Cleveland, O.
532. D. G. MOOMAW, Stone Creek, O.
533. W. H. GUNNISS, A. C. M. Co., Br. Dept., Great Falls, Mont.
534. W. E. CROWELL, Barrett Co., Cleveland, O.
535. J. R. MARKER, Ohio Pav. Br. Mfrs. Assn., Columbus, O.
536. A. L. GOLDMAN. Bldrs.' Sup. & Fuel Co., Cleveland, O.
537. L. G. KILBOURNE, Col. Br. & Terra Cotta Co., Columbus, O.
538. GEO. WEISS, Student, Cleveland, O.
539. G. H. MOOMAW, Shepfer & Moomaw Bros., Sugar Creek, O.
540. W. I. FOSTER, Carter & Foster, London, O.
541. T. ANDERSON, Smith-Phillips China Co., E. Liverpool, O.
542. J. MOOMAW, Shepfer & Moomaw Bros., Sugar Creek. O.
543. H. C. KLEYMEYER, Standard Br. Mfg. Co., Evansville, Ind.
544. H. F. KLEYMEYER, Stand. Brick Mfg. Co., Evansville, Ind.
545. JOHN ANDRES, Standard Brick Mfg. Co., Evansville, Ind.
546. GEO. W. SCHMIDT, Buffalo, N. Y.
547. GEO. L. SCHMIDT, Buffalo, N. Y.
548. WM. E. SANKEY, Sankey Bros., Pittsburgh, Pa.
549. E. H. WEIL, Enamel Products Co., Cleveland, O.
550. H. W. KOESTER, Norwalk Br. & Stone Co., Norwalk, O.
551. ROBT. L. BECK, Cleveland, O.
552. T. A. KLINEFELTER, Westinghouse El. & M. Co., Derry, Pa.
553. G. H. DUNCOMBE, JR., Evens & Howard F. B. Co., St. Louis.
554. O. C. GERBER, Green Engineering Co., Cleveland, O.
555. ALVA F. GLUCK, Frontier Brick Works, Niagara Falls, N. Y.
556. D. GOODWIN, Frontier Brick Works, Niagara Falls, N. Y.
557. W. HAMMERSCHMIDT, Lombard B. & T. Co., Lombard, Ill.
558. T. MALEY, Lakewood Engineering Co., Cleveland, O.
559. J. LOCKHART, Lakewood Engineering Co., Cleveland, O.
560. W. B. KINCAID, Kincaid Brick Co., Boons Path, Va.
561. G. BARLOW, Roessler-Hasslacher Chem. Co., New York.
562. HENRY T. WYNN, Wynn & Starr Co., Trafford, Pa.
563. MR. DUNCAN, Donley Brick Co., Washington, Pa.
564. B. E. LA DOW, Fredonia Brick Co., Fredonia, Kan.
565. W. H. SPENCER STRONG, Ohio Motor Co., Sandusky, O.
566. D. T. RIFFLE, Allegheny Brick Co., Ltd., Pittsburgh, Pa.
567. A. Q. STARR, Wynn & Starr Co., Trafford, Pa.
568. L. B. HUMPHREY, Humphrey B. & T. Co., Brockville, Pa.
569. J. G. BRAGG, U. S. Bureau of Standards, Pittsburgh, Pa.
570. H. L. McNEES, Kittanning Clay Mfg. Co., Kittanning, Pa.

571. C. B. McNEES, Kittanning Clay Mfg. Co., Kittanning, Pa.
572. W. P. VARNEY, Hy. Press Brick Co., Chicago, Ill.
573. J. O. TRAUTWEIN, Trautwein Dryer & Eng. Co., Chicago.
574. W. A. KEERMAN, Montezuma Br. Wks., Indianapolis, Ind.
575. F. A. COLE, Montezuma Brick Works, Montezuma, Ind.
576. CHAS. A. MILLAR, Price's, Ltd., Toronto, Ont., Can.
577. H. SOMERS, Somers Brick Co., Atlantic City, N. J.
578. S. S. KING, Dayton Lumber & Mfg. Co., Dayton, O.
579. W. H. WILLIS, Shorey-Willis Brick Co., Cincinnati, O.
580. J. C. SCHAFFER, Schaffer Engineering Co., Tiffin, O.
581. C. H. HORTON, C. H. Horton Co., Painesville, O.
582. F. E. KULP, Kulp Bros., Columbus, O.
583. W. H. KULP, Kulp Bros., Columbus, O.
584. W. F. KELLER, The Keller Brick Co., Cuyahoga Falls, O.
585. MEAD PETTS, Amherst, O.
586. M. B. McFEELY, Marion Mach. Fdy. & Sup. Co., Marion, Ind.
587. E. R. DILLEHAY, Dillehay Brick Co., Danville, Ky.
588. JACOB RAHN, Alliance Clay Products Co., Alliance, O.
589. E. H. MILLER, Alliance Clay Products Co., Alliance, O.
590. C. C. STRATTON, Alumina Shale Brick Co., Bradford, Pa.
591. A. M. COBBE, A. M. Cobbe Br. & Tile Co., Jamestown, N. Y.
592. E. C. WOLCOTT, Warren Brick & Tile Co., Warren, O.
593. J. W. WOLCOTT, Trumbull Clay Prod. Co., Warren, O.
594. H. V. BELL, Lake Shore Elevator Co., Cleveland, O.
595. F. L. WALDRON, Berlin Hts. Br. & Tile Co., Berlin Hts., O.
596. J. W. MOULDING, Thos. Moulding Brick Co., Chicago, Ill.
597. L. G. POWELL, Bostwick Steel Lath Co., Niles, O.
598. W. H. RYAN, W. H. Ryan Contracting Co., Lansing, Mich.
599. C. W. DENNISON, Delaware Clay Mfg. Co., Delaware, O.
600. H. J. ORTH, Clydesdale Brick & Stone Co., Pittsburgh, Pa.
601 to 800 reserved for ladies.
801. W. W. CUNNINGHAM, Clydesdale Br. & S. Co., Pittsburgh.
802. J. H. GLONINGER, Gloninger & Co., Pittsburgh, Pa.
803. E. L. SCHNEIDER, F. B. Holmes Co., Detroit, Mich.
804. E. F. PLUMB, Streator Brick Co., Streator, Ill.
805. S. C. MARTIN, Kittanning Br. & Fire Clay Co., Pittsburgh.
806. J. H. RENNARD, John H. Rennard Co., Wheeling, W. Va.
807. R. D. HAMILTON, Keystone Brick Co., Philadelphia, Pa.
808. JOS. O. HOSTETTER, Cleveland, O.
809. F. A. HOLMES, The Alliance Brick Co., Alliance, O.
810. E. A. STEWART, The Stark Brick Co., Canton, O.
811. JOS. P. BAYUE, Paving Engineer, City of Cleveland.
812. M. O. WEHINGER, Mansfield Clay Prod. Co., Mansfield, O.
813. W. W. SMITH, Samson Interlocking Tile, Shallow Lake, Ont.
814. L. B. PEART, Kittanning Face Brick Co., Kittanning, Pa.
815. CHAS. F. PARK, Syracuse, N. Y.
816. H. J. KNAPP, Cent. Clay Products Co., N. Tonawanda, N. Y.
817. A. S. CUNNINGHAM, Production Engineer, Marion, O.
818. W. M. NICHOLS, Cleveland Brick & Clay Co., Cleveland, O.
819. J. R. ZUMT, Cleveland, O.
820. ANDREW BASEL, Newburgh Brick & Tile Co., Newburg, O.
821. WM. E. ZEHNER, The Wright Zehner Co., Cleveland, O.
822. R. L. WILSON, Fallston Fire Clay Co., Pittsburgh, Pa.
823. E. E. KLOOZ, Youngstown, O.
824. T. E. WILSON, Pittsburgh Clay Products Co., Pittsburgh, Pa.
825. C. M. APP, Cleveland Rotary Club, Cleveland, O.
826. E. E. BOURQUIN, Archbold Brick & Tile Co., Archbold, O.
827. T. J. PARADINE, Erie, Pa.
828. A. B. KLINE, The John Kline Brick Co., Wickliffe, O.
829. B. J. CUMMINS, Cummins Brick & Tile Co., Syracuse, N. Y.
830. J. T. ATEN, The Arnold Creager Co., New London, O.
831. P. J. LAUBSCHER, Darlington B. & Min. Co., N. Galilee, Pa.
832. I. N. DeLAMATER, Jackson, Mich.
833. FRED S. HOLTZ, J. D. Fate Co., Plymouth, O.
834. CHAS. A. LEEDY, Youngstown, O.
835. J. E. KOONTZ, Columbus, O.
836. THOE H. SWAN, Rochester, N. Y.
837. A. W. O'HARA, Carthage, Ill.
838. J. J. KULP, Kulp Bros. Brick Co., Columbus, O.
839. E. J. MEHREN, Engineering Record, New York City.
840. L. D. WALRATH, Acme Shale Brick Co., Buffalo, N. Y.
841. GEO. HOOVER, Keim Brick Co., Osnaburg, O.
842. G. C. VIDETTO, Amer. Pulverizer Co., E. St. Louis, Ill.
843. W. H. GIBB, Gibb Instrument Co., Pittsburgh, Pa.
844. W. J. CLARK, Hamilton, Ont., Can.
845. R. L. DOLLINGS, Hamilton, O.
846. F. W. SHANKLAND, Amer. Clay Mach. Co., Willoughby, O.
847. P. J. CONLEY, Belden Brick Co., Canton, O.

ANNEX AND ANNEXERS.

Clayworking Machinery and Equipment Firms Enjoy Busy Week, Buttonholing the Delegates and Booking Good Orders.

THE button-holers had a large and varied assortment of button-holes to choose from convention week. The large number of delegates to the National Brick Manufacturers' Association convention thronged the lobby throughout the week. The exhibition hall, though convenient and ample, did not seem so attractive to delegates as in former years, perhaps for the reason that the individual machinery and supply firms were holding receptions and exhibiting models, blueprints, catalogs and other literature of machines or appliances in their private rooms.

The clay machinery firm having the largest delegation, as usual, was the American Clay Machinery Company, who held forth in parlors D and E, on the second floor. This company was ably represented by R. O. Perrott, C. B. Sharer, W. H. Merkel, F. L. Hopley, L. Haigh, L. W. Penfield, Harold Penfield, R. C. Penfield, E. J. Shaw, D. Brown, J. Martin, Raymond Brown, W. R. Cunningham, W. J. Carmichael and H. B. Crum. In front of their parlors on the second floor, facing the elevators, were numerous signs illustrating the need of fire-proof homes and boosting the American Clay Machinery in particular. The most interesting among these numerous signs and banners were the large colored drawing of their Haigh continuous kiln and the "Safety First" placards. There was always a crowd in these parlors, where the representatives extended the glad hand, presented the delegates with cigars, souvenir note books and general printed matter, including their new 1916 bulletin, and pointed out the features of their new adjustable lubricating brick die for both paving and building brick. A full-size die was on exhibition. This can be quickly adjusted to any size desired. This die does not wear out; you are simply required to replace the liner. More orders were booked than at any previous convention. This was attested to by the smiles on the faces of their representatives.

The Wellington Machine Company, of Wellington, Ohio, held forth in room 324, where H. S. and R. C. Bennett and D. J. Strickland were kept busy explaining the many merits of their line of machinery. Enlarged photos of their conveying system, dryer and horizontal soft-mud Wellington Special No. 7 brick machine were hung in conspicuous places on the walls. Their "Build with Brick" cigars and steel tape measures pleased the delegates, many of whom were taken to the several plants in Cleveland using the Wellington equipment, and a few visited their shops at Wellington.

The Mold Man—Geo. B. Mentz, of Walkill, N. Y.—enjoyed every minute in the entire week, and was sorry there were not 80 minutes to the hour. He had a big bunch of knives with him, which he distributed liberally, at the same time mentioning the fact that Mentz molds have proven satisfactory on hundreds of plants. He brought his wife along, as usual, and both reported a splendid good time.

We missed Chas. Burridge, of the H. Brewer Company, but were pleased to see G. S. Brubaker, that old standby, who presented souvenir pencils, distributed catalogs and described the feature of the large line of machinery and equipment made by his company. Business has been so good and the prospects are so bright that Mr. Burridge could not be present.

The Manufacturers Equipment Company had a large delegation consisting of I. M. Justice, J. O. Schroll, W. H. Sachs,

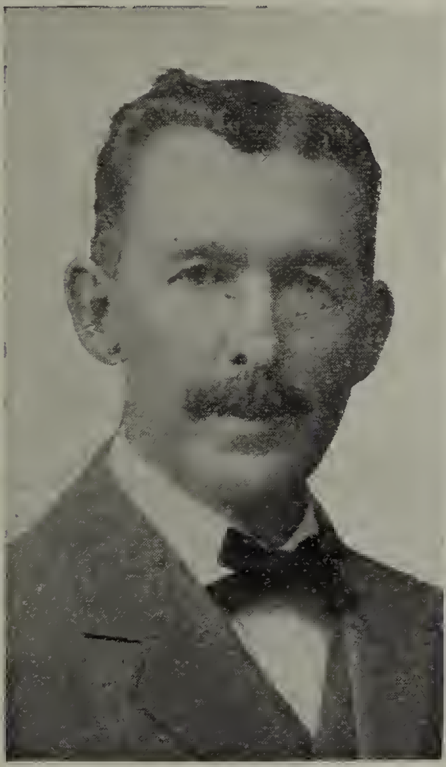
Attractive Sign of the American Clay Machinery Co.

E. M. Mahlmeister, J. W. Nushaw, J. C. Harris and J. T. Underwood. It was a busy week for these gentlemen in Room 306, where were exhibited photos of their burning system, a full page write-up of the plant of the U. S. Brick Company, Tell City, Ind., from the Perry County Tribune, a frame full of patents covering Justice dryers and the Underwood system, photos of the Meco single roll rock and shale crusher, drawings showing installation in detail of the Underwood system, heat records of plants, blue prints of clay crushing department, brown prints of dryers, model layout of the Underwood system, kilns, etc., comparative record of burning kiln No. 1, containing 75,000 building brick in U. S. Brick Company's plant, chart showing comparison with oil burning in up-draft kilns and a list of the purchasers of the Underwood producer gas burning system. The company had just finished the third burn for the Keller Brick Company, Cuyahoga Falls, Ohio, before convention week and were highly elated over the very satisfactory showing.

Messrs. H. Wirsching and E. DeGroot extended the glad hand and the "Book of Smiles" and literature in behalf of the Standard Dry Kiln Company, Indianapolis. Business must be good for their company judging from the pleasant countenances of these two gentlemen.

SOME OF THE MEMBERS OF THE LIVE WIRE DELEGATION OF THE DUNN WIRE-CUT LUG BRICK CO.

Frank B. Dunn



W. T. Blackburn

W. C. Perkins

F. T. Townsend

We were mighty glad to grasp the hand of our old friend, G. C. Stoll, as well as Roy Smith, A. A. Oldham and H. A. Carter, representing the Bonnot Company. These four expressed much satisfaction over the outlook for the Bonnot Company and delighted the visitors with a most useful pocketbook while they got a good word in for their splendid line of machinery.

The Dunn Wire-Cut-Lug Brick Co., of Conneaut, Ohio, which has made such a revolution in the paving brick business of the country, had a large delegation, consisting of Messrs. F. B. Dunn, W. T. Blackburn, R. T. Stull, W. C. Perkins, F. T. Townsend, H. C. Lehrbach and F. A. Churchill. Many of these gentlemen had their wives with them and all expressed the sentiment that the convention was the best ever. The company had an interesting exhibit at the Complete Building Show.

Otto was there. You know Otto? If you don't you "otto"—for he's a mighty entertaining fellow and knows a great deal about dryers—we refer to J. Otto Trautwein, of the Trautwein Dryer and Engineering Company, Chicago, Ill.

The Chase Foundry and Machine Company of Columbus, Ohio, Room 312, exhibted a small dryer car showing flexible and reversible bearings and an end of a transfer car with same bearing. H. S. Swinehart, F. A. Fleming and A. J. Dunn distributed catalogs and cigars and spent a busy week welcoming delegates. This has been the busiest year in the history of the company. Mr. Dunn stated that since the first of January they have booked orders right up to capacity.

Of course, Charlie Stevenson was there with both feet, had a good time, handed out his splendid souvenir, a most acceptable pocket book, and booked some good orders for the Stevenson Company, manufacturers of a high-grade line of clayworking machinery at Wellsville, Ohio. He was assisted by W. G. Stevenson, T. H. Hibbens and M. T. Abbott.

The Atlas Car and Manufacturing Company, of Cleveland, was represented by S. D. Wright and Leonard W. Harston. They were busy answering questions about the Atlas high efficiency cars and electric locomotives. Several of the plants in Cleveland use these cars and locomotives. Many of the delegates were interested in seeing these.

The J. D. Fate Company, as usual, was prominently in the lime light. Their large rooms, 343-345, were never vacant, there being a constant reception from the time the convention opened until it closed. "Ask Fate" was their slogan, printed on large red badges which bedecked the representatives, H. H. Fate, Geo. B. Drennan, H. J. Votaw, H. R. Sykes and G. A. Anderson. And ask Fate they did, judging from the discussion which were continually under way in these rooms. Scores of photographs, blue prints and drawings adorned the walls and tables were covered with a huge mass of catalogs and leaflets. Of unusual interest were the photographs showing their gasoline locomotives in operation on 80 plants, where they are being used for either clay haulage or industrial purposes. These locomotives are built for 18 to 56½ gauge. Large drawings showing the Fate cutters, pug mills, special Imperial machine, dry clay feeder, The King Machine, Special Premier, the Hummer Brick and Tile Machine and various other machinery and appliances drew the attention of the visitors. The J. D. Fate Co. has three locomotives in operation

(Continued on page 368.)

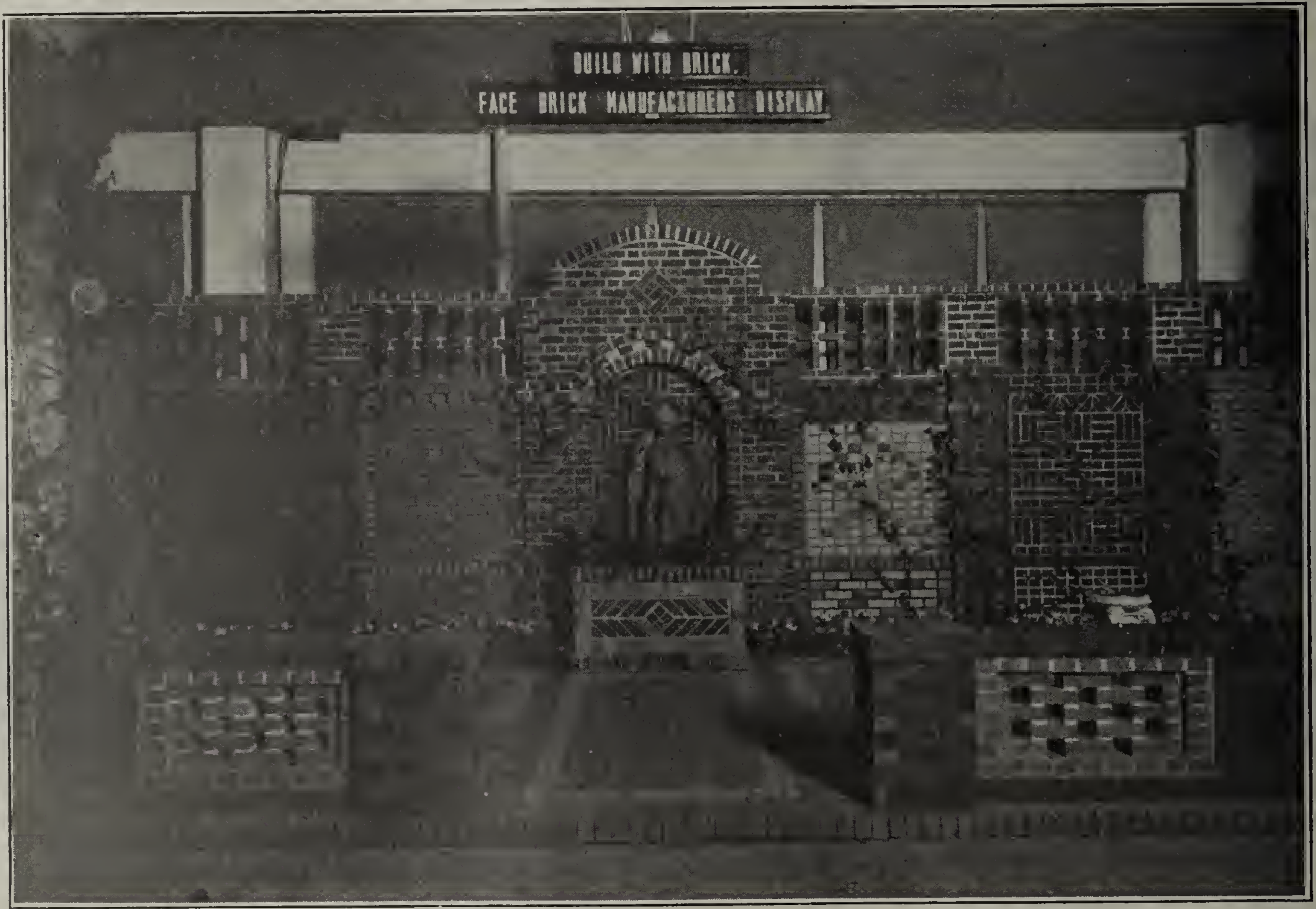
AMERICA'S FIRST COMPLETE BUILDING SHOW.

A Remarkable Exhibition of Building Materials Held in Cleveland, February 16 to 26, Seen by Thousands of People.

EVERY individual who visited the Coliseum in Cleveland during the time America's first Complete Building Show was open to the public, February 16 to 26, was treated to a splendid exhibition of building materials, with many novel displays, enjoyable music and the revelry of the joy of the crowds.

The eleven days of the show were crowded with business for the exhibitors. It was indeed busy times, for over 125,000 people passed through the gates and most of them came prepared to stop, look, listen and ask questions. It was an exposition of every phase of commercial and domestic building, featuring the safety, economy and comfortable building of the American home—"a show for the men-about-to-build conducted by the men-with-the-material-to-sell."

This show was promoted and brought to a successful conclusion by the Society Advocating Fire Elimination, the secretary of which is Mr. Ralph Stoddard, Cleveland, Ohio. Great credit is due to his untiring efforts in promoting such a worthy proposition; he is indeed to be congratulated on the great showing made. The results were most satisfactory in every way, and while the show was not conducted for profit, the promoters are assured of a safe margin after the bills are paid.



Central Portion of Exhibit of the Ohio Face Brick Manufacturers.

One of the big features of the show was the bringing together of all the building interests and having them work harmoniously for the success of the show. It produced to a remarkable extent for the exhibits. Practically every one having space has already asked for space in a second show, which will be held at some future time. It was the idea of the promoters from the start to make the show a source of education for the man about to build, and in this respect it more than met their anticipations. The visitors had the opportunity of seeing every sort of material used in ordinary construction, as well as the best equipment and furnishings.

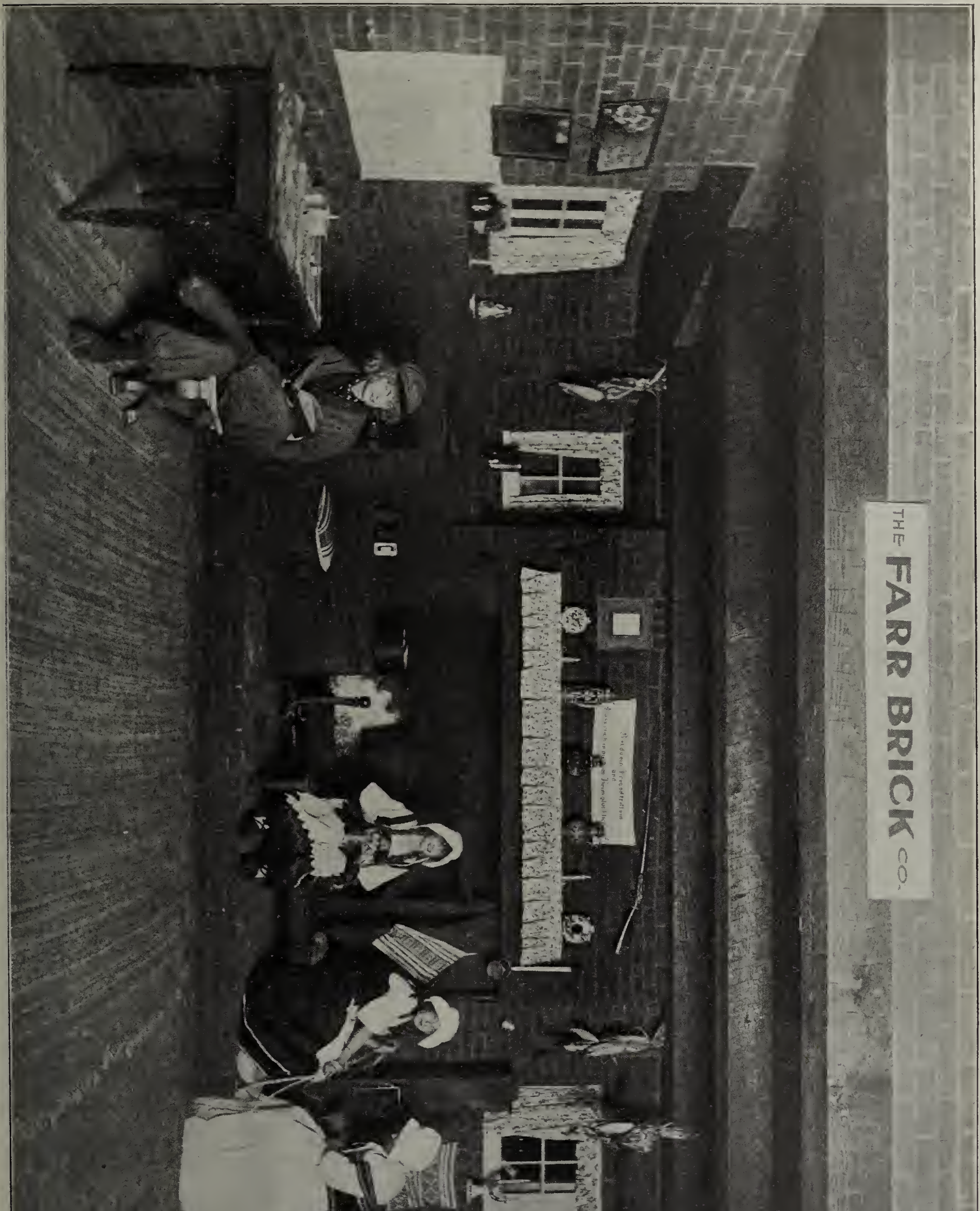
They are having a score of inquiries every day from people who visited the show, asking for definite information as to where certain materials can be purchased. The result of the show will be to greatly stimulate building operations in Cleveland, and the promoters believe it will mean building with better taste and better materials.

The exhibitors of brick in the show are already feeling a marked increased interest in their material on the part of prospective builders, and while no one material in the show was permitted to overshadow the others, those who showed fire-proof products are more than satisfied with the result, and feel a great good has been done the whole industry.

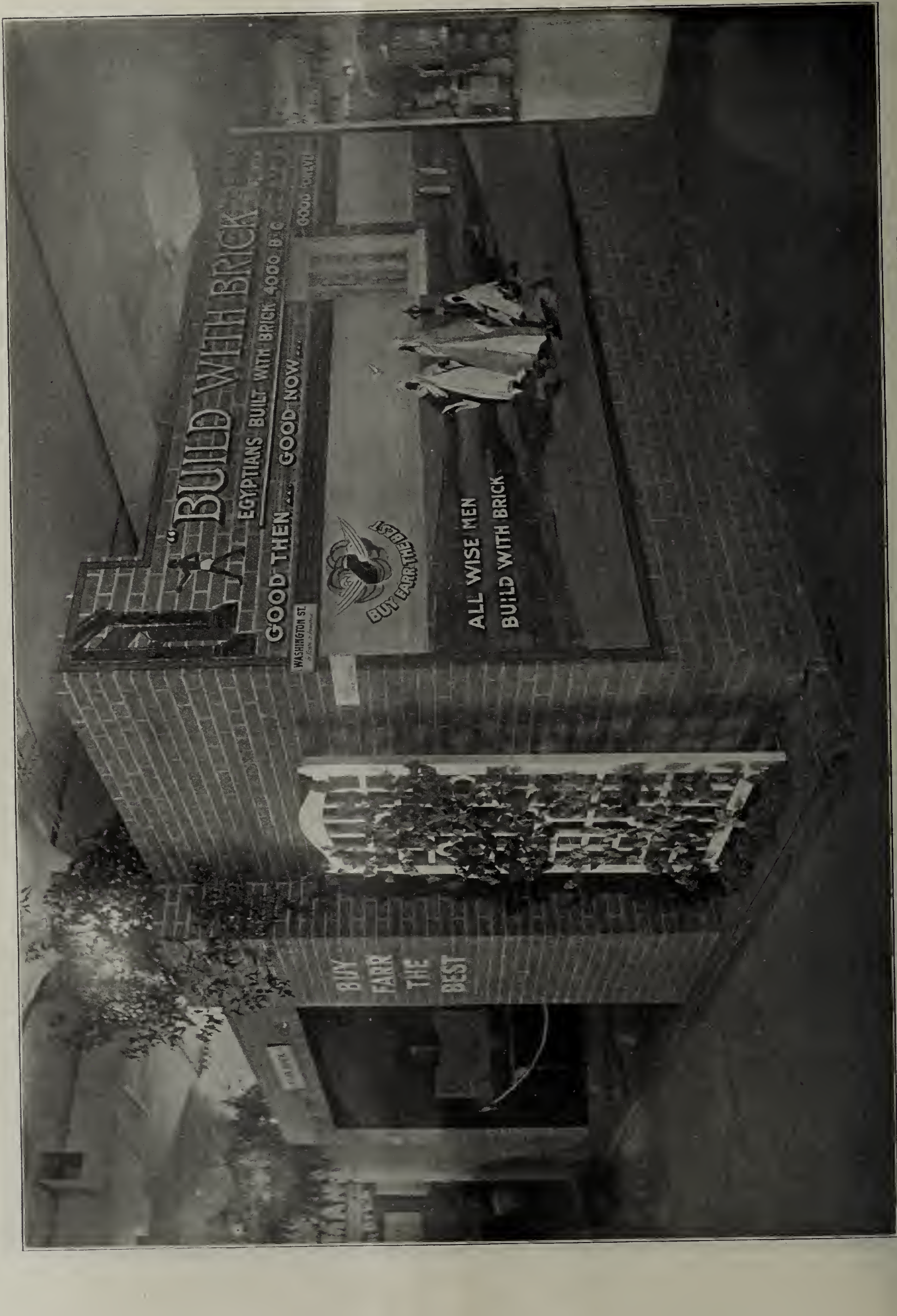
The exhibition of drawings submitted in the architectural competition for $3,000 houses attracted a great deal of attention, and many of these will be duplicated throughout the central states. The promoters already know of several who are preparing to start work upon the first prize quoted drawing to meet the demand for copies of these drawings. The Building Show will publish at once a book containing fifty of the best designed and will give the widest circulation.

The show was indeed the largest and most effectual exposition of building materials ever held in this country, and it was not alone a local proposition. The success of the show was greatly aided by the numerous conventions, including the ceramic, lumber and hardware, which came to Cleveland to boost their materials during the ten days of the exposition. This gave the show national character, and its influence through the thousands of delegates will be carried to all parts of the United States.

The members of the National Brick Manufacturers' Asso-


THE FARR BRICK CO.

THE DUTCH KITCHEN. THE MOST UNIQUE EXHIBIT IN THE COMPLETE BUILDING SHOW.



"BUY FARR THE BEST" EXHIBIT OF COMMON BRICK IN THE COMPLETE BUILDING SHOW.

ciation did not need to feel ashamed of the showing made by brick, and it is believed one of the influences of the show will be to enthuse the brick manufacturers in the promotion of their industry.

The idea of the show originated with the S. A. F. E., and it was largely financed by the members of that organization. Mr. Stoddard, in a recent favor, stated that they had no regrets in having opened the doors to all materials, and that their judgment in believing the public capable to judge between various materials is more than justified by the results. He believes personally that it will be very much easier another time to have the brick manufacturers co-operate than it was to stir their interests in this show.

On entering the Coliseum through an arbor effect, the visitor was at once inspired by the beauty of the scene before him and the impression given of a miniature city, full of cleverly made toy houses, barns, terraces, roadways, etc. Each aisle had corner signs, with the names of the principal streets of the larger cities of the United States and Canada.

The English Garden, exhibit of the Euclid Builders' Supply Co, Cleveland, Ohio.

The Hollow Tile Manufacturers, consisting of the Barkwell Brick Company, the Camp Conduit Company, the Cuyahoga Brick and Shale Company, the Ohio Clay Company and the Whitacre Fire-proofing Company, had an unusual display of their hollow tile. A full-sized first floor, stuccoed hollow tile wall, showing construction on the inside, and an exterior wall faced with rough-faced interlocking tile made by the Ohio Clay Company, laid up with one-inch white mortar joint, formed their half-circle exhibit. The trailing morning-glories and pink flowered vines, the beautiful colors in the rough-face tile walls and the white trellis made this most inviting.

At either end of the wide central pathway leading to the right and left of the entrance were two handsome exhibits of clay products. These were so attractive that the visitor did not care to pay particular attention to any other exhibits until he had closely inspected these. One was of the Face Brick Manufacturers' Association of Ohio and the other of the National Paving Brick Manufacturers' Association. Above the former exhibit was an electric sign with the magic words, BUILD WITH BRICK, and the name of the association. This display occupied a space about 100 feet long and followed the carefully prepared plan for same drawn by Architect Geo. W. Richie, of Cleveland. The central portion of this display consisted of a fountain in a brick-paneled niche, forming a portion of an artistic garden wall, which extended to an elevated pergola at one end of the exhibit, and a brick-walled, brick-floored room with handsome fireplace at the other extreme. The fountain was that of a youth emptying a water bottle. The pergola consisted of brick piers and heavy wooden beams decorated with trailing roses. Flower beds of tulips enhanced the beauty of the brick-paneled garden walk. This walk was made up of different designs showing various methods of bonds. All colors possible were shown. A bench and terra cotta sun dial added to the attractiveness of the grass plots. This was one of the finest exhibits in the entire show. The expense was borne by twenty-six members of the Ohio association, headed by Mr. M. Everhard, of Massillon. There were over 7,000 prospective builders who signed cards handed out by Mr. Jeff. A. Ganger, who had charge of the exhibit. Those who signed their names and addresses will receive a book of plans of ten brick houses of moderate cost. So attracted were the owners of the Coliseum by this exhibit that they have determined to retain the display as a permanent exhibit.

The National Paving Brick Manufacturers' Association exhibit was on a three-foot elevation, surrounded by a paving block wall. A winding miniature brick-paved road, with small lamp posts, letter boxes, walks, autos, etc., bordered a well-executed lawn with miniature gardening effects, which surrounded a model house and garage built of small paving bricks. The miniature porch furniture and small porch light made quite a hit with the older people as well as with the children. Another enjoyable feature for the kiddies was a green pasture, with toy cattle and horses. A clay tablet with cuneiform letters and the translation created much interest. The back walls were covered with pennants and placards containing forceful statements relative to vitrified brick roadways and structures. On one side of this exhibit was a small space showing an entrance to a brick home, while on the other was a small reception space, the walls of which were built with the Dunn Wire-Cut-Lug bricks.

The most unique exhibit of the entire clay products manufacturers' displays was that of the Farr Brick Company. Again this company proved its great progressiveness in advertising its common brick. The exhibit was that of a Dutch kitchen, with an old brick open hearth and quaint ovens, brick floors as clean as a pin, Dutch windows, Dutch curtains, the Dutch beamed ceilings, the Dutch candlesticks, spinning wheels, cupboards and furnishings, even to the wooden shoes and the entire Dutch family, which entertained the crowds at all hours. On the side wall was painted a picture of the desert, with the three wise men looking up at the star, which in this case happened to be the winged trade mark of the company. Above appeared the slogan, BUILD WITH BRICK, and the statement, "Egyptians built with brick 4000 B. C.—Good then, good now, good forever"—"Buy Farr the Best," was certainly impressed upon the minds of the visitors.

Another attractive brick exhibit was that of the Euclid Builders' Supply Company. This represented a beautiful English garden laid in brick and quarry tile. A handsome statue, with splendid lighting effects, stood in a niche behind the fountain under the white pergola wisteria vine-clad. A large buff terra cotta vase made by the Northwestern Terra Cotta Company and exhibited by the Queisser-Bliss Company, agents for same, stood in the center of one of the wide aisles. It was perhaps eight feet high and filled with ferns and palms, making a very pretty effect.

The Kansas Buff Brick and Manufacturing Company, Buffville, Kans., had a most inviting exhibit of their unusually attractive brocade brick. There were comfortable chairs for the visitors to rest in while drinking in the satisfying beauties of these brick walls and the white trestle decorated with vines. Pots of fragrant daffodils made the women prone to linger.

The Cuyahoga Builders' Supply Company had sectional displays showing panels of the Alliance rugs, Alliance Brick Company, Alliance, O.; Star-Tex, John Starkey, Canton, O.; rustic Orientals, Martinsville Brick Company, Martinsville, Ind., and the products from the kilns of the Vanport Brick Company, Pittsburg, Pa.; Sugar Creek Clay Products Company, Sugar Creek, O.; Stark Brick Company, Canton, O., and the Darlington Brick and Mining Company, Pittsburg, Pa. They operated a picture machine showing films taken of the mining, transportation, refining and manufacturing of asphalt by the Barber Asphalt Company, and exhibited a number of their building materials other than clay products.

A glance to the right of the entrance printed indelibly on the brain a picture unique in every detail. This was the exhibit of the Cleveland Board of Lumber Dealers. It consisted of nine splendid models of attractive homes, standing about two feet high, well situated on a large platform surrounding a half oval pahtway. This platform was hidden by clever landscape gardening, with a miniature wooden block pavement near the edge. Miniature cement walks and tiny electric light posts made the street effect complete, and sloping terraces led up to and beyond the houses, with trees, flower beds and shrubbery most artistically arranged.

The Robinson Clay Products Company had a small but interesting exhibit, displaying their sewer pipe, flue liners, stoneware and photographs of several of their nine large plants.

The Queisser-Bliss Company exhibit consisted of brick panels of various shapes and kinds of brick, several building specialties and a wall set up with "Fiske lock tapestry brick."

The Ludowici Celadon Company had a display of roofing tiles, including both red and green. Samples of quarry tile were also shown.

The vitrified clay industry exhibited vitrified pipe with placards bearing the words, "The only sanitary, non-corrosive material for underground drainage, such as house drains and house sewerage. Its use specified by the State of Ohio," and "Vitrified pipe culvert approved by the Ohio Highway Commission." An illuminated sign on a fireplace stated "23 per cent. fires from defective flues. Use flue lining." The exhibit was in charge of John L. Rice.

The Cleveland Builders' Supply Company had an immense exhibit, which consisted of the materials they handle, such as mortar colors, asphalt shingles, cements, etc. There were walls of brick made up of panels of the various lines of brick they sell.

PERSONALS HEARD IN THE LOBBIES.

Many of the delegates inquired for Alfred Yates.

The Graphonola presented to the Secretary by members of the National Organization in celebration of his thirty years of service to the industry, assisted materially on one occasion to furnish one step and fox trot music to a happy party of ten couples who cared not whether it was Eastern or Central time.

There certainly was a world of pleasure for everybody and our old friend Gardner, of the American Enamel Brick Co., New York, got his share with Archie Reid, Chick Bonner, Walter Purcell, Leo Childs, E. F. Grande and H. C. Podolsky filling the chairs on either side of the interlocutor. Some introductory overture.

The Siamese Twins, L. D. Binyon and Jas. A. Hogan of Chicago, Ill. as usual were inseparable.

Sickness prevented such loyal fellows as Fritz Salmen and William Conway from attending. Better luck next time we all say.

The Fiske & Co., Inc., certainly had a good representation with J. Parker B. Fiske, New York; Alfred J. Rogers, Boston, Mass.; C. Forrest Tefft, Darlington, Pa.; F. W. Richardson and Francis T. Owens, Ridgeway, Pa.

H. P. Humphrey, who attended the convention, was elected vice president of the Cook Pottery Co., Trenton, N. J., at the annual meeting of the directors of that company. Mr. Chas. Howell Cook was elected president and treasurer, while Paul G. Duryea was elected secretary.

There were thirteen ex-presidents at the American Ceramic Society present out of a possible seventeen.

Lazear certainly makes some swell looking dame. He was all rigged up in full costume on the mezzanine floor just previous to the opening of the convention. Good looking girl, wasn't he, Will?

Mason Chilcote, superintendent of the Ohio State Brick Plant, Junction City, O., mingled with the delegates for a short while. His plant is a state institution, operated by convict labor. They have a dormitory housing seventy-five trusties. The men work nine hours daily, making builders and pavers. This plant doesn't sell in the open market, simply supplying material for state work. The men work there until paroled. It is an out-of-doors life, which makes them better men.

It was indeed a treat to shake hands with Walter Hull, Aylesworth Ogden and a number of others who have been absent the last few years.

Ira "Irene" Sproat was there with his Shore Dinner appetite.

The active interest taken by the young men of the American Ceramic Society was a treat to every one, particularly the fathers of same.

Will we have to crown Purdy the royal jokester, or will we just have to sympathize with his family? He had a good time and proved a good goat collector.

Ex-President Mayer said he would put aside the black robes and don the red. Does he mean the fiery vest has been packed away with moth balls these several years? If so, we may expect to get more than serum next convention.

G. H. Clippert, Chas. H. Bryan, Wm. Clippert, John S. Haggerty, Wm. B. Wreford and F. B. Holmes made up a bunch of live wires from Detroit that know the value of boosting the BUILD WITH BRICK slogan.

Those who came from far distant points to attend the convention were: Geo. E. Derry, Calgary, Ont., Can.; W. H. Gunniss, Great Falls, Mont.; G. C. Stoll, Los Angeles, Cal.; W. C. Mitchell, Seattle, Wash.; N. B. Davis, Ottawa, Can.; C. H. Bray, Helena, Mont.; W. W. Dickinson, Jr., Little Rock, Ark.; E. H. Michel, Slidell, La , and G. D. Wild and C. H. Frost, Los Angeles, Cal.

The Metropolitan Paving Brick Company had a large delegation, consisting of J. G. Barbour, H. S. Renkert, O. W. Renkert, H. I. Riseling, M. J. Stone, H. D. Barger, O. T. Witter, O. H. Wilson and A. L. Curry.

Chas. T. Harris, secretary of the Hollow Building Tile Manufacturers' Association, hobnobbed with the clayworkers and enjoyed renewing old acquaintances.

The Canadian delegation consisted of thirteen live wires, who got their full share of benefits and pleasures out of their week's convention work.

CONVENTION OF AMERICAN CERAMIC SOCIETY.

Splendid Attendance, Excellent Papers and Important Sessions Made It Best in the History of that Organization.

THE EIGHTEENTH ANNUAL convention of the American Ceramic Society, with headquarters at the Hotel Statler, was held in Cleveland, February 21 to 24. It was the best convention in the history of this technical organization. More than a hundred and fifty members registered and the attendance at all the various sessions was splendid, there being few vacant chairs at any time throughout the reading of the seventy odd papers and the discussions which followed. The work accomplished was invaluable. From the point of membership, financial condition and prospects for future growth this organization is certainly to be congratulated.

President R. R. Hice,
Beaver Falls, Pa.

Arthur A. Watts, Columbus, Ohio,
Editor A. C. S. Transactions.

Vice-president F. K. Pence,
Zanesville, Ohio.

The new associate members who were taken in at this annual meeting were as follows: R. M. Balmert, Perth Amboy, N. J.; M. J. Cole, Logan, Ohio; Gordon P. Gavin, Trenton, N. J.; Seije Kondo, Tokio, Japan; R. H. Lardin, Creighton, Pa.; R. H. Pass, Syracuse, N. Y.; Howard T. Reeve, Southbridge, Mass.; Earl M. Tilton, Columbus, O.; Otogoro Umeda, Tokio, Japan; Chas. F. Carman, Berkeley Springs, W. Va.; R. W. Greene, Mayfield, Ky.; Harold W. Holmes, Detroit, Mich.; Wm. M. Jacobs, Creighton, Pa.; Robt. W. Jones, Albany, N. Y.; C. S. Kennison, Pittsburg, Pa.; T. A. Klinefelter, Derry, Pa.; Andrew Malinoveszky, Lincoln, Ill.; J. D. Ramsey, St. Marys, Pa.; L. R. Office, Columbus, Ohio; Jos. E. Martz, Columbus, Ohio; Paul G. Larkin, Denver, Colo.; H. C. Ginn, St. Marys, Pa.; J. B. Blewitt, Lead, So. Dak.; Jas. Bailey, Corning, N. Y.; Robt. E. Anderson, Worcester, Mass.; Frank B. Dunn, Conneaut, Ohio; W. E. Segsworth, Toronto, Can.; F. H. Chapin, Cleveland, Ohio; H. F. Crew, Zanesville, Ohio; Chas. F. Muckenhirn, Pittsburg, Pa.; R. L. Clare, Woodbridge, N. J.; R. W. Taylor, Canton, Ohio; Jas. Darling, Cincinnati, Ohio; Harold E. Clark, Champaign, Ill.; Oliver O. Bowman II, Trenton, N. J.; W. K. Cronin, E. Liverpool, Ohio; Ed A. Brockman, Chicago, Ill.; Herbert S. McMillan, Detroit, Mich.; Ray A. Horning, Beaver Falls, Pa.; E. W. Knapp, Toronto, Ohio; R. H. White, Worcester, Mass.; H. G. Keese, Champaign, Ill.; Thomas S. Browning, Champaign, Ill.; J. W. Wright, Champaign, Ill.; C. E. Bates, Champaign, Ill.; J. L. Crawford, Champaign, Ill.; Edgar H. Weil, Cleveland, Ohio, making a total of forty-seven.

There were ten promotions to full membership, namely: M. F. Beecher, Worcester, Mass.; D. E. Humphrey, Cleveland, Ohio; C. S. Kinnison, Pittsburg, Pa.; A. A. Klein, Pittsburg, Pa.; R. J. Montgomery, Pittsburg, Pa.; A. Silverman, Pittsburg, Pa.; Wilber Stout, Columbus, Ohio.; W. Teetor, Lawrence, Kans.; A. E. Williams, Champaign, Ill.; Ira Williams, Corvallis, Oregon.

The men nominated for promotion to active membership, to be voted on next year, were as follows: Walter Denmead, Schenectady, N. Y.; C. B. Harrop, Columbus, Ohio; H. B. Henderson, Columbus, Ohio; E. C. Hill, New York; W. H. Howat, Pittsburg, Pa.; Charles J. Kirk, New Castle, Pa.; Emerson P. Post, Elyria, Ohio; J. W. Ward, Derry, Pa.; F. W. Walker, Jr., Beaver Falls, Pa.

The present financial condition is gratifying; the society has a cash balance of $1,059, with several hundred dollars outstanding in good accounts. The total gain in membership ending February 1, 1916, was thirty-three. The total membership of the society February 1 was 510.

During the course of the convention the society approved a design for a pin to be used as a badge for the active membership.

In the election of officers, L. E. Barringer, of Schenectady, N. Y., was elected president; F. K. Pence, Zanesville, Ohio, vice-president; Edward Orton, Jr., Columbus, Ohio, secretary; Herford Hope, New Brighton, Pa., treasurer. The trustees elected were A. F. Hottinger, Chicago, Ill., 1919; H. F. Staley, Ames, Ia., 1918; G. H. Brown, Pittsburg, Pa., 1917. A. S. Watts was appointed editor of the transactions for the ensuing year.

The convention was opened Monday morning with an address by Hon. Myron T. Herrick, considered the first citizen of Cleveland, who made a general speech of welcome. This was followed by the presidential address of Richard R. Hice, Beaver, Pa., which dealt with the clays of Pennsylvania.

The second session, which was called to order at 2:00 p. m., was the first of six sessions devoted to the reading and discussion of papers. The other sessions were held Tuesday morning, Tuesday afternoon, Tuesday evening, Wednesday morning, and the final one lasted until nearly 7 p. m. Wednesday.

Monday evening the society enjoyed what they call Section Q. During this function reports were made on the work of the several branches of the society, including the Beaver Section, the Ohio State University Students' branch, and the New York State Students' branch. Application for student branches at University of Illinois and Iowa State College were received and approved.

During the Wednesday afternoon session a resolution was adopted for the appointment of a committee of five consisting of the board of publication and two other members whose duty it was to prepare a written code of rules which should govern the presentation of papers. The purpose of this is to regulate the form but not the substance of papers; particularly does this rule pertain to the regulation of the size of drawings submitted, the lantern slides used and to the standardization of a mode of procedure.

The papers presented were read under classified groups, namely: Group I, Geological, Mineralogical, Chemical Discussion on Origin, Occurrence and Properties of Clays and Other Raw Materials. Group II, Winning and Preparation of Pottery Clays and Other Minerals. Group III, Pottery Bodies and Body Making. Group IV, The Forming and Manufacture of Pottery Wares. Group V, Drying and Burning Pottery Wares. Group VI, Decoration, Glazing and Coloring Pottery Wares. Group VII, Testing Pottery Products. Group VIII, Physical Apparatus and Measurements. Group IX, Hydraulic Silicates, Cements and Plasters. Group X, Glasses and Enamels. Group XI, Manufacture of Heavy Clay Wares. Group XII, Drying, Burning, and Kilns for Heavy Clay Wares. Group XIII, The Testing of Heavy Clay Products. Group XIV, Educational Topics.

Group one consisted of six papers, the most practical of which was the one on "The Utilization of Ohio Clay-bonded Sand Stones for Silica Brick Manufacture." This was by H. B. Henderson and Wilbur Stout, Columbus, Ohio. In this paper they called attention to the fact that there is in Ohio a class of rocks practically equivalent to English Ganister and German Dinas stone which have not been exploited to anywhere near the extent that their importance deserves.

Ellis Lovejoy,
Columbus, Ohio.

Treasurer Herford Hope,
New Brighton, Pa.

Secretary Edward Orton,
Columbus, Ohio.

Group two consisted of four papers. The most important in this group was by Ira L. Sproat, of Columbus, Ohio, on "The Commercial Control of Kaolin Refining." This represented a long and expensive investigation by the U. S. Bureau of Mines, it being not so much of an investigation as it was an application of theories already worked out. These pertained to the principles of colloidal chemistry applied to the refining of kaolin. Mr. Sproat discussed the process of the clearing up of the coloring ingredients of clay by washing it while in a dispersed condition, and then flocculating it prior to filter pressing.

The paper by Thomas N. Bains, Jr., of the Case School of Applied Science, Cleveland, Ohio, was one of the most valuable papers read before the association. The subject treated was the "Theory of Ore Dressing by Flotation and its Relation to the Dressing of Clays." The principle of this is the making of electrified froth to which magnetic or mineral impurities will adhere and then floating them off and thus securing the separation desired. In the dressing of ores the operation, of course, is the taking of the ores out of the impurities in the froth, while in the dressing of clays it is the taking of the impurities out of the clays.

There were two papers worthy of particular mention in group three, namely: "The Use of Domestic Materials in the Manufacture of China," by Chas. F. Binns, Alfred, N. Y., and "The Physical Properties of Some Ball Clays in their Effects on Porcelain Bodies," by T. A. Klinefelter, East Pittsburg, Pa. The first was a very practical paper in which was described the testing of a number of domestic clays to find out just how they could be used in the manufacture of china, while the latter dealt with an attempt to get around the use of foreign clays by using American clays, measuring the properties of American ball clays and combining them in such proportions as to make them equal to foreign clays.

The two papers under the head of group five were splendid. These were illustrated by lantern slides and showed the degree of success of the two most advanced types of kilns. The titles of these two papers were, "Results Obtained in Firing Sanitary Earthen Ware in the Dressler Tunnel Kiln," by C. J. Kirk, New Castle, Pa., and "A Satisfactory Continuous Kiln," by L. E. Barringer, Schenectady, N. Y. The second paper dealt with the Faugeron kiln. These two kilns vary widely, but both are of a type where ware goes through on cars in the same manner, but there is a wide difference in the theory of heat distribution. The Dressler is based on the principle of convection currents, the air making little loops through two sets of flues in which the same air supply is used over and over again. The Faugeron kiln is more like the ordinary continuous kiln, the draft flowing in a continuous stream and the air being used once only.

Group six contained two notable papers by Mr. A. S. Watts, namely: "A Study of Bristol Glazes Compounded on the Norm Basis," and "A Study of Bristol Glazes, Compounded on the Eutectic Basis." In the first of these two papers dealing with the same subject studied from two points of view, the author showed that he had succeeded in getting a mixture of the same minerals used by many preceding workers which was more fusible by four or five cones than any preceding worker had secured. In the second paper he showed how he had taken three extremes of a triaxial diagram and studied all of the compounds that could be made between. He made eutectics of three various groups of materials and then made a eutectic of these three eutectics, thus making the softest material possible of all these soft materials.

In group seven, the paper, "The Constitution and Microstructure of Porcelain Bodies," by A. A. Klein, Pittsburg, Pa., involved the most research. The author showed that when heating kaolinite, the white base of clay breaks down, producing silica and the mineral sillimanite, but that this mineral remains in a morphous condition and doesn't crystallize until a porcelain heat is reached. When this is reached the sillimanite is gradually crystallized, and then more and more the higher the heat. These interlacing crystals are what make porcelain so strong.

In group eight, the strongest paper was by C. B. Harrop, Columbus, Ohio, on the subject, "The Inadequacy of Static Pressure Draft Gages." This showed that the methods we use for measuring drafts are wrong, that we have to figure the velocity of the draft and not the pressure.

The most important paper in group eleven was by Mr. James Bailey, Corning, N. Y., on "Variations in the Measured Linear Shrinkage of Clay Test Pieces." He illustrated his paper by using a sample of clay with which he made a simple investigation. He showed by compressing the clay before measuring the shrinkage you get about half of the shrinkage and by stretching the clay you get twice as much shrinkage. He showed by drawings why these operated the way they do in saggar bodies. He declared that to actually measure shrinkage we must pay careful attention to details which are not ordinarily considered at all.

Under the heading of group twelve a good clear presentation of facts were told in the paper by William R. Veazey, Cleveland, Ohio, on the subject "The Principles of Oil Burning for Industrial Purposes," Marion W. Blair, Thornton, W. Va., submitted a paper under the head of "The Elusive Twenty Per Cent. Paving Block." This was a very impressive presentation of the facts concerning the testing of paving brick. Another important paper in this group was that of Professor Edward Orton, Jr., on "A Comparison Between the Absorption, Crushing Strength and Resistance to Artificial Freezing of Some Ohio Building Bricks." He proved that the sulphate test is not too severe to prove a successful criterion in making a frost test.

PROFESSOR ORTON APPOINTED RESEARCH PROFESSOR OF CERAMIC ENGINEERING.

THE READERS of The Clay-Worker will probably be surprised to learn that Professor Edward Orton, Jr., has at his own request been relieved of his exacting duties as dean of the College of Engineering and head of the department of ceramic engineering at the Ohio State University and has been appointed research professor of ceramic engineering, on part time, effective July 1, 1916. We publish herewith his letter to the board, which appeared in the university daily newspaper, the "Lantern," on March 8, 1916:

> "President W. O. Thompson,
>
> "My Dear Sir: I desire to be relieved from my duties as dean of the College of Engineering and as head of the department of ceramic engineering, and to that end hereby tender my resignation of both offices, which I beg will be accepted at the coming meeting of the board of trustees.
>
> "I have been thinking of this matter for a year or more, and have reached this decision only after a very complete consideration of all its aspects. Without going into a discussion of all my reasons for this decision at this time, I may mention the two most important ones, viz:
>
> "First. The increasing pressure of business responsibilities which I ought neither to neglect nor avoid.
>
> "Second. My desire to devote my future educational efforts to scientific and industrial research along the lines of my specialty, rather than to routine teaching or to educational administrative work.
>
> "If, in the increasing development of research work at the university, either in the engineering experiment station, or in any other organization that may be created for similar purposes, a desire should be felt by yourself, and the board of trustees, and my colleagues of the engineering faculty to use a portion or my time, I should be glad to consider such a plan. My resignation in my present capacity, however, is in no wise conditional or dependent upon any arrangement which may be entered into subsequently in regard to research work.
>
> "In conclusion, allow me to thank you, Mr. President, the board of trustees, and my colleagues of the faculty, for the very great opportunity which the university has given me during these years since I was called here to teach, and for the ever-ready assistance, the inspiration, the kind co-operation, and the delightful companionship which I have experienced and enjoyed and which have been a material factor in whatever good I may have accomplished here. It is only with the hope that I may still enjoy these relations, in part at least, that I have reached the above decision.
>
> "Very respectfully submitted,
>
> "EDWARD ORTON, JR."

The research professorship to which Professor Orton has been appointed is the second one ever created at the Ohio State University, the first one having been to Profssor Herbert Osborn, an eminent specialist in economic entomology. Under the terms of Professor Orton's appointment, he is to give from one-third to one-half of his time to ceramic research, the balance being reserved by himself for his private business and public interests outside of the university.

The research work which Professor Orton is expected to undertake will be done in the laboratories of the department of ceramic engineering, or in the laboratories of the engineering experiment station on the campus. The first work will probably be a continuation of that which has been in progress for several years relating to the physical properties of building bricks and their classification into commercially distinct grades, based upon these physical properties. Professor Orton is chairman of committee C-3 of the American Society for Testing Materials, and the work of that committee is being directed along that line.

The future of the department of ceramic engineering at the Ohio State University seems exceptionally bright and promising. Professor Arthur S. Watts is now acting head of the department, and upon the expiration of the current academic year, will undoubtedly succeed to the position permanently. Professor Watts has won a strong place for himself in the ceramic industries of the United States and among ceramic scholars here and elsewhere. He has obtained the confidence and regard of the students to an unusual degree, and the whole department is permeated with a fine spirit for hard work and genuine scholarship. Professor C. B. Harrop, who has charge of the engineering side, especially in regard to drying, burning, kilns and driers, will remain in charge of those subjects. Another man will be appointed to take up a part of the class work formerly carried by Professor Orton, and will probably also give a portion of his time to research, so that the personnel of the department will be four men hereafter in place of three.

The fact that researches will be constantly in progress in the laboratories is expected to have a splendid influence in awakening the interest and enthusiasm of students.

The Stability of Brick Chimneys—The stability of a brick chimney must be such that it will stand the wind pressure. It must be so calculated that it has a certain degree of elasticity, which is equal to the wind pressure. In order to calculate this we must find the distance (a) from the center point of gravity. This condition is found for a round chimney according to the formula $a = 0.125\frac{D_2 + d_2}{D}$, for an octagon chimney the same is $a = 0.1282\frac{D_2 + d_2}{D}$, and for a square stack it can be figured as $a = 0.118\frac{D_2 + d_2}{D}$. D= the exterior diameter and d the interior diameter of the stack. The wind pressure varies somewhat and can be figured at from 150 to 240 kilos per square meter (from 30 to 50 pounds per square foot). —Tonind. Z. No. 6, 1914.

THE CLAY-WORKER

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A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

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226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXV. MARCH, 1916. No. 3.

CURRENT COMMENT.

The 1916 convention is now history.

* * *

Busy days should come as early as the weather will permit, and continue all summer.

* * *

The brick machinery folks seem to be having a much deserved inning at better business.

* * *

All predictions for a great convention were fully realized at Cleveland, as the preceding pages prove.

* * *

The light of the kiln fires should glow brightly throughout the land, for the prospects look bright ahead.

* * *

Brick easily leads concrete in appearance, but the cement folks are away in the lead in the game of advertising their product.

* * *

The political pots will start boiling soon, but meantime let us make hay out of the business boom—display the slogan, BUILD WITH BRICK.

* * *

The paving brick folks not only have a good product to work with, but they are some pushers themselves and know how to boost the paving game.

* * *

It looks like what the average brick manufacturer needs to be prepared for this year is to furnish lots of brick promptly and to do this as efficiently as practical and maintain a reasonable price.

* * *

The government has undoubtedly wasted lots of money on inland waterways and it may waste a lot more uselessly, but that does not alter the fact that there is need to properly look after and improve these waterways for the benefit of freight transportation.

* * *

Perhaps one reason why so many people find fault is because it is such an easy job.

* * *

Fuel economy is an important factor in brickmaking, but handling economy is also a thing that needs looking after.

* * *

The motor truck has come to be a mighty factor in the material handling world, and it is one of those things that just keeps coming.

* * *

The more the brick manufacturer learns about the manifold uses of brick in construction work the better shape he is in to push his product.

* * *

Speaking of the commercial side of the brick business, it may be said that were we to entirely cut out the commercial side there wouldn't be much business left.

* * *

Enough following up of the subject of silos and permanent farm building will bring the conviction that there is room for a good use of brick to build other things besides the home upon the farm.

* * *

We may differ as to the amount of peace sentiment Ford may create with his advertising campaign on the subject, but we can all agree that he will easily succeed in putting a lot of his troublesome money into circulation.

* * *

Wonderful improvement has been made along the line of better burning and less kiln waste, but there is always a chance to make it a little better, as was patent to those who heard the subject discussed at the N. B. M. A. convention.

* * *

Extending fire limits in the cities helps the building brick business some, but, after all, it is a whole lot easier to persuade people to build with brick than it is to force them to. We have the material and the arguments to do the persuading with, and all we need is to use them. Fling your banner to the breeze—BUILD WITH BRICK.

SOME HIGHWAY PROJECT.

W. D. Stephens, member of Congress from the Tenth district of California, has an idea in his head that he has put before Congress in the form of House Bill 3667, which constitutes some highway project. His idea is to construct and maintain what he terms a national defense highway, circling the United States within its borders and running near the Atlantic, Pacific and Gulf coasts, as well as our northern and southern boundary lines. It would mean 10,000 miles of highway, which undoubtedly would be useful in case of war with other nations, and during times of peace would certainly be of value and give satisfaction to the people of the United States. There is no question on that point. In fact, it is easily the biggest proposition of highway ideas that has yet been put before the people in defintie form. It will be a permanent addition to the nation's wealth if it's paved with brick.

SCHOOLHOUSE DESIGNS.

At the recent meeting of the Southern Pine Association one of the recommendations that will very likely be acted upon was for the secretary to prepare the outline of a proposition for the erection of pavilion types of schoolhouses not to exceed one story in height, and offer prizes aggregating $150 for the best three designs, to accommodate from 100 to 150 pupils. The idea is to offer $75 for the best design, $50 for the second and $25 for the third. And, of course, these designs will be for schoolhouses built of lumber.

Every brick man knows, and every other man, woman and child ought to know, if they but stop and think about it a minute, that a schoolhouse should be built of brick. Brick is not only the best building material and the one that insures permanency, but it is also the one material to help safeguard the school children against fire. We have had enough loss of child life in schoolhouse fires that every one should be impressed now with the necessity for building with brick, which will not burn.

We need hardly expect the lumber people to exploit or recommend brick, however, especially manufacturers who are spending their time and money and energy exploiting their own business, which is lumber. It is up to the brick manufacturers to exploit brick for the schoolhouse and to suggest designs that are attractive, and otherwise take such an active part in this line of work that the schoolhouse of the future will be built of brick.

A HINT TO OUR MACHINERY FRIENDS.

The Clay-Worker has made the suggestion to the makers of brick machinery heretofore that there should be an opportunity presented in Europe when the days of reconstruction come, and now it is desired to add to this another hint in connection with Mexico.

Our editorial writers of the big papers and magazines are already gravely discussing the remaking of Mexico. It is true these discussions are punctuated by outbreaks of lawlessness, which at times suggests that we will have to do some chastening of a lot of native Mexicans before the big problem of remaking the country and developing its industries is taken up.

Notwithstanding this, however, we are evidently at the dawn of the day when Mexico is to be remade, reconstructed and started on the road to that progress which means a solid, civilized country, with a lot of home-building and industrial development.

In this connection there is a chance for the clayworking machinery people to do some mission work by encouraging the development of clayworking industries, to the end that in the upbuilding of Mexico it may be built right by building with brick from the very beginning. There ought eventually to be great possibilities in this field for machinery sales and for the development of the brick industry down there. It will take time, patience, mission work and money, but in the end efforts of this kind properly directed should pay good returns.

PLANS FOR THE MODEST HOME.

The brick man is put in a peculiar position in the matter of exploiting his product by the use of plan books and what is termed cheap plan offerings for modern homes. There is a general assumption that the brick man, by taking up work of this kind, will alienate the good-will of the architect, consequently the man wanting to build a cheap or modest priced home gets most of his ideas for its design from those interested in pushing other material.

In connection with the lumber industry we have dozens and dozens of plan book offerings of various kinds, and one of the late reports indicates that even the architects have taken a hand in it. A firm of architects in Kansas City, Mo., have gotten out a plan book, called "My Architect," in which they set forth a number of plans for homes, barns, etc. They claim the idea is not to catalog a number of ready-made plans, but rather to place before the general public a variety of ideas for construction in concrete form, from which they can select something that will suit their needs by a number of changes. Still they sell the plans of these books in competition with other plan propositions; so there you are.

Meantime the brick man must hold back on this kind of exploitation, otherwise he is likely to offend the architect, who presumably is a great friend to brick and brick construction. Still the architect does not seem to be offended at lumber and cement, and yet those interested in exploiting these products are very industriously using plan book schemes of many different kinds.

Making plans for the modest home is really quite a problem. In the first place, the modest cost of the home will not permit any extensive outlay for architectural service. For this reason architects have heretofore gotten very little business from this source. Moreover, they need never expect to get much business except that they do it in the shape of what might be termed ready-made plans that can be produced in duplicate. In other words, for the architects to get into this game and make anything worth while out of it they, too, will have to go into plan book business. Some of them are already doing this; others are looking toward it and wondering about how they may benefit themselves and at the same time put a touch of real architecture into homes.

Perhaps if the brick men and the architects will get their heads together on this proposition they may be able to develop a plan book scheme and an architectural service that will solve the problem, will help boost brick, will help get business for the architects and will insure a better order of home-building and a more extensive use of brick.

THE HOLLOW WALL.

There is quite a lot of interest being taken in the hollow wall in home construction. Whether this is because of moisture talk on the part of the competing materials, whether it is due to the hollow wall idea introduced by cement or whether it merits all the favor it receives may be questions for argument, but just the same the one important fact remains that the hollow wall idea is making its appeal to the building world, and the really wise men, instead of seeking to explain or combat or argue about it, will simply seek for ways and means to humor this desire of builders.

The hollow wall is not a difficult proposition. It is easy enough to make it either with hollow clay blocks for the inner wall of the building or to put up the brick construction with a hollow or air space between the outer and inner walls.

The only real point for argument or for rivalry is that between the use of common brick and hollow clay blocks for the inner walls. Where hollow clay blocks are extensively produced and easily available there has been a natural disposition to argue for these, and perhaps this has had quite a lot to do with the present popularity of the hollow wall idea in construction.

There is no question, either, but what the hollow clay block construction makes a good form of construction, neither is there any desire here to argue against it. The idea is simply to point out that where this is not readily available the hollow effect can be produced by the brick man in various ways.

One way that is growing in popularity is that of making hollow brick. This subject has been described in these pages heretofore. It is both possible and practical to make hollow building brick on the same order as the hollow tile. They can be burned in less time; they weigh less, which lightens the hauling and freight burden, consequently a saving, in a measure at least, that reimburses the extra cost for making them.

Then, entirely aside from hollow block and hollow brick, it is easily practical to make hollow wall construction with common brick, no matter whether it is a two-course or a three-course wall. Perhaps the better form of construction is to make a three-course wall with a two-inch air space between the outer or face course and the inner course. In this way one can secure all of the desired effects of dead air space and can get just substantially the same wall as to strength, because in any hollow wall construction it is necessary to tie the outer face wall, the veneer of brick, to the inner construction, and this can be accomplished just as well in work made of brick entirely as in work made of brick and tile or solid brick and hollow brick.

So if the builders insist upon hollow walls, don't argue against them, but show them various ways that may be followed to secure them, and you will help the cause along more than if you undertook to fight against such ideas.

THE LITTLE FELLOW'S INNING.

There is an old saying that every dog has his day, which is nothing more nor less than a graphic setting forth of the fact that things go round in circles or cycles more or less, and from time to time what was the under dog in the struggle becomes the upper one, and so on. We have a modern illustration of this by a pretty wide presentation today of the idea that the little fellow in business is having his inning.

The little fellow has been the under dog in the industrial world for quite a period now. Beginning back fifteen years ago, more or less, there dawned the era of big business, when ideas and efforts were centered upon consolidation and the promotion of big industrial combinations on the theory that this meant more economy and better service, as well as less competition.

Part of the theory was all right, but we are now finding several blow holes in it, and in the clearing away of the smoke of battle and the regeneration of industry since the days of trust busting and general lambasting of big business, followed by industrial depression that has shaken many an institution to its foundations, we are beginning to see that after all, the little fellow stands, if he is entitled to stand, and the little fellow in the aggregate makes up a big factor in business.

It has always been a pet hobby of the writer that there never was a day but what the little fellow had his chance in the world. True, for a decade or more, sentiment was against him and this was a serious handicap. The mere fact that the public thought that it took big business to do good business made a hard row for the little fellow to hoe, both in selling his product and in getting financial support.

Now, in the general turning to scientific analysis and setting forth of points of efficiency, we are finding that the little fellow has his advantages as well as his disadvantages. For one thing, he has the inside track when it comes to giving real service, and for another thing, he has a decided advantage in overhead expenses.

Overhead expenses have come to be a great burden in big business and, unfortunately, there goes along with it a lower order of general efficiency than in small business because there is not the same direct personal interest on the part of the employes. Also, when it comes to service, the small institution has its advantages. This was pretty well illustrated in a story upon the subject of the "Business of Buying." A buyer for a railroad company says, as illustrative of this, that if he has a pump along the line somewhere that needs repairs suddenly he knows that if that pump is made by a big institution of many departments, that his rush order for repairs will be referred from one department to another and he will not get the service and quick action he will get had he bought the pump from a smaller institution. He says if the pump is from a small place, he can call up the superintendent over the telephone and inform his that such and such parts have gone bad and get immediate action in the matter of repairs.

This is just one thing that illustrates the service advantages in little business. There are many other instances which might be cited, both of service opportunities and of savings that are effected in overhead. The purpose here, however, is not to elaborate upon these so much as to point, for the encouragement of the smaller factors in the trade today, that the little fellow is having his inning in the public mind. The public is, for the time being, fully appreciative of the advantages of the personal touch with a little fellow and so long as this sentiment prevails, the small man in business, who has been the under dog for a number of years, will, figuratively, have his day, and find his business horizon much brighter than it has been heretofore. It looks like we are in for a great era of prosperity in which the little man in business will get his full share, and before it is all over many of the little men will perhaps become big men. This is as it should be and we are glad to see it and to herald the fact that the smaller institutions are now having their inning in the industrial world.

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WHEN WRITING TO ADVERTISERS
MENTION THE CLAY-WORKER

VITRIFIED PAVING BRICK.

A valuable treatise on the manufacture and use of Paving Brick up to date. By H. A. Wheeler, E. M. Second Edition. Mailed to any address on receipt of $2.00.

T. A. RANDALL & CO., Publishers, Indianapolis.

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QUARTZ
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Any desired mesh up
to dust. C. L. only.
Inquiries solicited.

RIVERSIDE MFG. CO.
Caddo Gap, Ark.

Much the Largest Manufacturers of Clayworking Machinery in the World.

$300,000 FOR BRICK.

They had an election here in Bucyrus, on February 15, and voted ten to one to spend $300,000 for more brick streets. That ought to be additional assurance to the brick men that the city of Bucyrus is willing to reaffirm its confidence in brick streets and its loyalty to the American Clay Machinery Co.

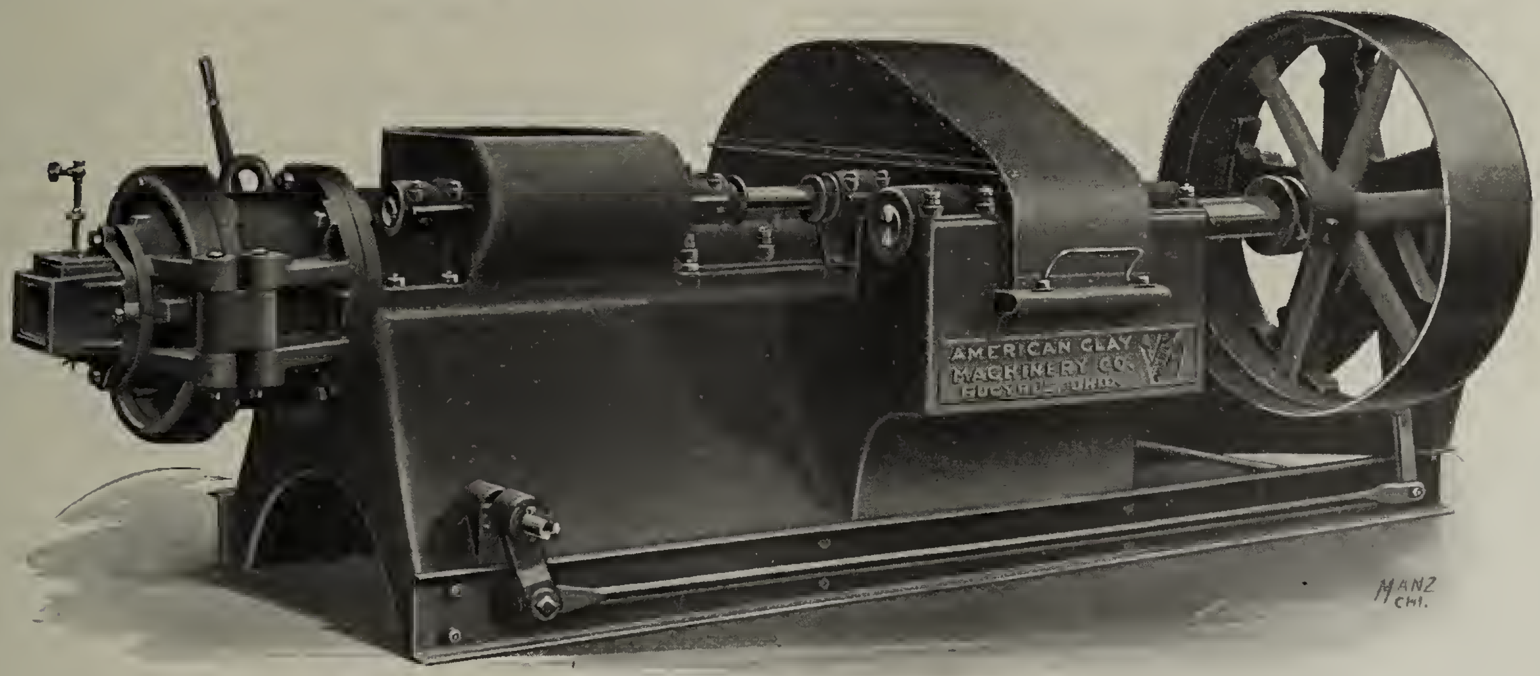
The Bucyrus Industrial Association, which got behind the election, sent the following greeting, painted on a sixteen-foot banner, to the Paving Brick Convention at Cleveland. Here is the greeting:

$300,000 was unanimously voted on February 15 for six additional miles of brick streets in Bucyrus, Ohio.

The American Co. desires to take this means of publicly thanking Bucyrus for this vote of approval and loyalty. Bucyrus was one of the first cities of the country to adopt brick paving, and many of our streets are 35 years old and still good. Our community is also paving the Lincoln Highway with brick.

At the Cleveland Convention we showed our new adjustable brick die for quick changing from builders to pavers. A description will be sent on application.

We sold to the Convention two of our big No. 290 Auger Machines for brick and hollow ware; also a number of other machines and a Haigh Continuous Kiln. Here is an illustration of the No. 290. Full description on application.

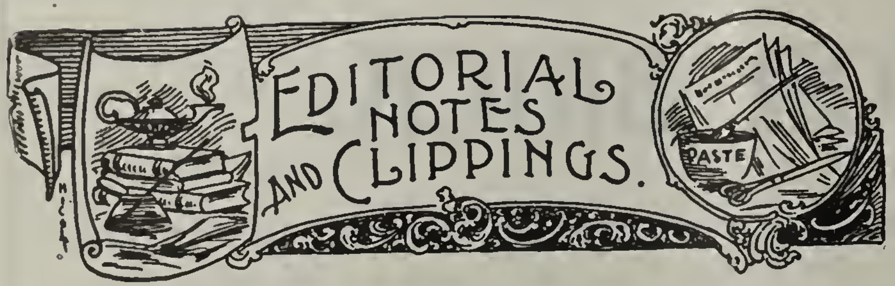

AMERICAN CLAY MACHINERY CO. BUCYRUS, OHIO.
MANZ CHI.

The American Clay Machinery Co.

Bucyrus, Ohio, U. S. A.

Bucyrus is on the Lincoln Highway and We Are Paving it With Brick.

EDITORIAL NOTES AND CLIPPINGS



W. B. Nelson, of San Antonio, Tex., expects to start a brick plant at Myton, Utah.

The Bennett Brick Company, at Terre Haute, has been incorporated by Charles E. and Anna Bennett.

The Kier Fire Brick Company, of Altoona, Pa., will make extensive improvements at its plant at Klader Station.

The Perkiomen Brick Company, of Reading, Pa., has been authorized to decrease its capital stock from $300,000 to $100,000.

T. J. Spraggins & Sons Company has been incorporated, with $31,000 capital stock. They will erect a brick plant at West Point, Miss.

The National Brick Company, of Spokane, Wash., has been incorporated by Irene Hoare, J. L. Trone and B. W. Young, with $30,000 capital stock.

The Federal Brick Company, of Chicago, Ill., has been incorporated to manufacture brick and clay products. The company is capitalized at $150,000.

John J. Prew, a pioneer brick manufacturer of Holyoke, Mass., died at his home recently. Mr. Prew was seventy-one years old and is survived by one daughter.

The Kankakee Brick and Tile Company will build an immense addition to their present plant at Kankakee, Ill., on which they will spend something like $85,000.

The Superior Fire Clay Company, St. Louis, Mo., has been incorporated, with a capital stock of $20,000, by Julian Simon, Jacob Leonhardt and D. J. O'Keefe, to manufacture fire clay products.

C. A. Armstrong has brought suit against the Copeland-Inglas Brick Company, of Birmingham, Ala., for $2,500, for injuries which it is claimed were sustained while in the employ of the company.

The Sneyd Enamel Brick Company, which was recently incorporated, has taken over the plant of the Trenton Fire Brick Company, at Trenton, N. J., and will remodel and equip same for the manufacture of enameled brick.

W. H. Buhlinger, of St. Louis, has purchased the interest of Mr. Karnes in the Hill & Karnes Brick Company, at Paducah, Ky., and the firm will hereafter be known as Hill & Buhlinger. Mr. Buhlinger will be secretary and treasurer of the company.

The Bradford Shale Products Company is the name of a new concern which will erect a large brick manufacturing plant at Bradford, Pa. The company is capitalized at $100,000. It is expected to have the plant in operation by early spring.

The Minnesota Brick Company, of Minneapolis, a concern recently incorporated, expects to have their new plant ready for operation by June 1. The incorporators of the company are J. L. Robinson, N. H. and E. E. Leighton and F. G. McMillan.

Ernest T. Hand, of Plainfield, N. J., has bought the old brick plant of the Berkeley Brick Company, formerly operated by Gustav Davies, which has been closed down for some time. The plant will be remodeled, new machinery installed and operation started within a short time.

W. B. Hutchinson has sold his interest in the Ris-Clay Brick Company, at Michigan City, Ind., to Arthur Reoske, who has been manager of the plant for some time. The company has been reorganized and the following officers elected: W. J. Riley, president; C. W. Hotchkiss, vice president; Arthur Roeske, secretary and general manager.

Mr. Hohn L. Green, president, and Mr. Richard D. Hatton, general manager of the Laclede Christy Clay Products Company, St. Louis, Mo., were at the plant of the Alsey Brick and Tile Company, of Alsey, Ill., February 24. They also visited the fire clay mines of this company, and were much impressed with the thickness of the vein and the large number of acres in the body of clay. Over 800 acres of land are underlaid with high-grade fire clay, ranging from 18 feet to 20 feet deep. The mining facilities are No. 1, having a perfect solid rock roof 4 feet in thickness. Very little timbering is necessary, only to support the sides of the entries.

A. E. Jennings, of Central City, Ky., will erect a plant for the manufacture of drain tile.

M. L. Sanderson, of Byhalia, Miss., contemplates the establishment of a brick plant at Meridian, Miss.

The Smith Brick Company, of Omaha, Neb., recently booked an order for 300,000 brick for buildings to be erected by the city.

Thomas Conners, of Columbus, Ky., has purchased the plant of the Wickliffe Clay Products Company and will manufacture tile and pottery.

The Gadsden Brick Company, of Gadsden, Ala., will install some new brick machinery and plan to operate the entire plant by electricity instead of steam, as heretofore.

The Central Clay Products Company, of North Tonawanda, N. Y., will build three new kilns in order to meet the demand for brick, which has been increasing constantly for some time.

The firm of Mays & Goode, brick manufacturers, of Woodlawn, Ore., has been dissolved. H. N. Goode has taken over the interest of Mr. May and will continue business in his own name.

Charles N. Wynkoop, of Columbia, Ind., died at his home in that city February 18. Mr. Wynkoop had been engaged in the brick manufacturing and contracting business since 1881, having learned the brickmason's trade when a boy.

J. B. Malloy, H. T. McCartney, H. H. Howalt and others, of Youngstown, O., have incorporated the Carbon Brick Company under the laws of Ohio, to operate a brick plant just across the line in Pennsylvania. The capitalization is given at $50,000.

The Warren B. Ferris Brick Company, with head offices at Columbus, O., is making a number of improvements in its plant at Canton. When completed the plant will have a capacity of 40,000 brick a day. The improvement includes a new dryer equipment.

The Warrenton Clay Company, of Warrenton, Ore., has been organized, with $50,000 capital stock. The directors of the company are: George W. Warren, George Chew, E. P. Smiley, Warren Overpack and Clifford Barlow. The company will manufacture sewer pipe, drain tile, hollow building block and other clay products.

Within the past week a company has been organized at Frostburg, Md., and will be known as the Mayer Brick and Tile Company, with Henry Mayer, G. Dud Hocking, R. A. Walter, F. H. Schrieber and H. V. Hesse as the incorporators. The capital stock will be $50,000; of this, $25,000 will be preferred and $25,000 common. Stock is now being offered for sale.

The Utah Fire Clay Company, of Salt Lake City, recently booked an order for 150 miles of vitrified drain pipe, to be used in the reclamation of 7,000 acres of low land in the vicinity of Delta, Utah. This order is said to be one of the largest orders ever given for drain tile in the United States and will probably be the first extensive use of drain tile in reclamation work.

Mr. W. W. Cunningham, for the past thirteen years president and general manager of the Pennsylvania Clay Company, of Pittsburg, Pa., has resigned his position and is now associated with the Clydesdale Brick and Stone Company, Oliver building, Pittsburg, as vice president. He will have charge of the manufacture and sales of the "Clydesdale" shale paving block, that will shortly be put on the market.

Frederick C. Bogk, of Ricketson mineral paint fame, is one of the aldermen-at-large of Milwaukee, Wis., who has not taken out papers for his renomination. As a result, citizens of Milwaukee have started a movement which will have for its purpose, as explained by Attorney William Kaumheimer, "the task of insisting on a faithful servant being re-elected to the aldermanic body without the expense of conducting a campaign. As chairman of the finance committee of the common council Mr. Bogk has been steadfastly attempting to keep down appropriations without harassing the work of the department. He has been active in the salary revision work and that work is to be completed during the coming fall. Standing always for efficiency and economy in public affairs, he has been progressive and active in promoting movements looking for welfare of the people. He has behind him experience which makes his service invaluable to the municipality.

Continued on page 366.

TRADE B MARK

Barrett's PAVING PITCH

Wisconsin Ave., Milwaukee, Wis. Showing 18 year old brick pavement filled with Barrett's Paving Pitch.

Eighteen Years Old

IT was in 1897 that this brick pavement was laid in Milwaukee. It is close to the railroad station and receives considerable traffic.

The joints of the pavement were filled with Barrett's Paving Pitch.

After 18 years of service the pitch is still on duty, tightly sealing the foundation against water and frost.

The contour of the pavement is excellent, proving that there has been no undermining.

There is no hollow rumbling when vehicles pass over it. There never is in pitch-filled pavement.

The footing for horses is excellent because every joint is a groove which gives good grip to the hoof.

Of course, there is not a crack anywhere in the whole pavement, for cracks are impossible in a pitch-filled pavement.

Likewise there is no bulging up of the brick or any signs of pressure against curbing or manholes. Every joint is an expansion joint. In hot weather when the bricks expand the pitch yields. In cold weather when the bricks contract the pitch merely sinks a little lower in the joint and never lets go of the brick.

The history of Wisconsin Avenue and thousands of other streets proves that the right way is to use good brick and Barrett's Paving Pitch.

Booklets free on request. Address our nearest office.

The Barrett Company

TRADE B MARK

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B.
Halifax, N. S. Sydney, N. S.

EDITORIAL NOTES AND CLIPPINGS—Continued.

It is hoped a sufficient number of men will interest themselves to induce Mr. Bogk to continue his service."

The plant of the Greenbrier Shale Brick Manufacturing Company, at Pence Springs, W. Va., is now ready for operation. D. E. Lahey is president of the company.

Warren McDaniels expects to start a brick plant at Port Arthur, Tex., where there is a good demand for building brick. Heretofore all the brick have had to be shipped in.

The Delta Brick and Tile Company, of Detroit, Mich., was recently incorporated, with $10,000 capital stock. Those interested are E. A. Foote, S. H. Wightman and D. L. Blair.

The Commonsense Tile Company, of El Paso, Tex., has been incorporated by T. L. Marrin, Benjamin Franklin and Lucy A. Watts. The company is capitalized at $10,000.

The West Virginia Paving and Pressed Brick Company, of Huntington, W. Va., will make a number of improvements in the plant, including the building of three down-draft kilns.

The Pennsylvania Wire Glass Company, of Dunbar, Pa., write that they are interested in a kaolin deposit and would like to get in touch with firms who install plants for washing kaolins.

Hays H. Buskirk, of Bloomington, Ind., writes that he has a large tract of shale which he has had tested with good results, and contemplates going into the brick manufacturing business.

Suit for $2,000 has been brought against the Illinois Valley Brick Company, of Deer Park, Ill., by Mrs. Brunnato, mother of a young man who was killed January 21, while in the employ of the company.

The New Era Brick Company has been incorporated at Richmond, Va., with $60,000 capital. Ford M. Booth, of Richmond, is president, and James E. Cuthbert, of Petersburg, is secretary of the new concern.

A young man with some experience in the brick manufacturing business and a limited amount of capital, looking for a good opening in the Middle West with an old established firm, will do well to get in correspondence with the advertiser, "Box 3—Tile, care Clay-Worker."

The St. Louis Refractories Company, of St. Louis, Mo., was recently incorporated, with $200,000 capital stock. The company will manufacture clay and manganese products and will erect a plant at Columbia, Ill., where the company has more than eighty acres of land. C. J. Crawford is president and J. A. Dewes secretary and treasurer of the company.

Henry Schafer, president of the El Reno Brick Company, El Reno, Okla., writes that they are now manufacturing brick at the rate of 25,000 per day, but that they contemplate overhauling the plant, and so will be in the market for a complete equipment, and will build a new dryer and kilns. They are now in the market for new and second-hand steel dryer cars.

The plant of the Hanover Press Brick Company, which has not been operated for some time, was sold at receiver's sale recently to a company composed of Wesley Montgomery, P. S. Phillips, Will Smith and W. W. Gard, of Newark, O., and J. M. Adams, of the Iron Clay Brick Company, Columbus, O. The new concern, which will be known as the Hanover Brick Company, has been incorporated, with $50,000 capital stock. It is anticipated the plant will be operated to full capacity in the near future.

The plant of the Barrington Steam Brick Company, at Barrington Centre, a suburb of Providence, R. I., was completely destroyed by fire March 11. The fire, which started in the engine room about 5 o'clock in the morning, had gained such headway when discovered by the night watchman that nothing could be done to save the plant. The fire is supposed to have started from spontaneous combustion in the oily waste which had been left in the engine room. Preparations were under way to start up the plant, which had not been in operation for some months. The loss is almost entirely covered by insurance.

M. E. Gregory, proprietor of the Brick, Terra Cotta and Tile Company, of Corning, N. Y., gave his annual banquet to his employes February 29, at which time he celebrated the twentieth anniversary of the opening of the plant. The banquet was given at the Corning Club, and the guests were met at the door by Mr. Gregory and his son Creveling. A number of speeches were made following the dinner by a number of the prominent men of Corning. Mr. Gregory stated that if all the brick which had been made at the plant in the last twenty years were laid in a brick pavement, the roadway would run from Corning to New York, and then from New York fifty miles down into New Jersey. Many of the men present have been employed at the plant continuously ever since the start.

OBITUARY.

A Prominent Chicagoan Dies as a Result of an Operation.

C. D. B. Howell, for many years a conspicuous figure among the brick manufacturers of Chicago, having been at the head of the Illinois Brick Company for several years, but more lately associated as vice-president and director of the Purington Paving Brick Company, of Galesburg, Ill., died February 21 at the Evanston hospital where he had undergone an operation. Mr. Howells was born in Dutchess county, New York, in 1858. The funeral was held at his residence in Chicago and his body taken to Poughkeepsie, N. Y., for burial. Mr. Howell's untimely demise will be mourned by a host of personal friends to whom he had endeared himself by his kindly and considerate nature.

The directors of the Purington Paving Brick Company, at a recent meeting, adopted the following resolution in his memory:

"Mr. C. D. B. Howell, our friend and fellow director, died February 21, 1916, in the 58th year of his life. He was generous to the needy, enthusiastically enlisted in the furtherance of efforts to assist his fellowmen to become self-reliant citizens, a good neighbor and an upright man, a genial companion and a wise counsellor. We deplore his untimely loss, mourn with his widow and the bereaved, and direct the secretary to record this in our minutes, and forward an engrossed copy to Mrs. Howell, in behalf of the board of directors."

Death of Benjamin D. Walcott.

The clay craft of the country lost an able and popular representative in the death of Benjamin D. Walcott, of Indianapolis, which occurred February 20. He had been in poor health for a long time, but had continued to give personal attention to his business. He was president of the Indianapolis Terra Cotta Company, having directed the affairs of that enterprise for many years. Mr. Walcott was a member of the National Brick Manufacturers' Association, but had not attended the convention of late years which prevented him from enjoying the deliberative sessions. He was a man of unusual genial nature; everyone who knew "Ben" Walcott loved him. A wife and two daughters survive.

Charles C. Cummings, owner of the Cloverdale Tile plant at Cloverdale, Ind., writes that he is in the market for fire brick for kiln building.

1916 ANNOUNCEMENT

We want a SWIFT SLACK COAL BURNING KILN and a SWIFT HOT-FLOOR DRYER in your vicinity. If there are none—to the first one answering this ad we will furnish one or both PLANS at a cost of the plans alone.

Drop a line to

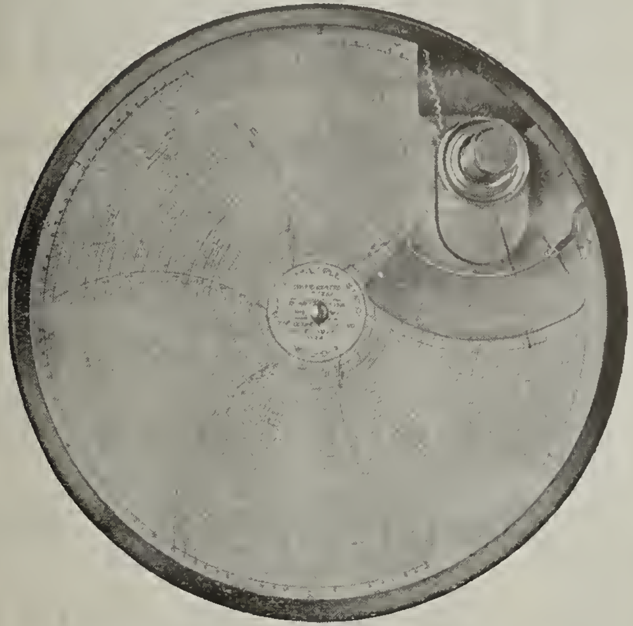
SWIFT

Lock Box 269, OTTAWA, ILL.

Indicating Instrument for use of burners.

The Pyrometer with a Conscience.

which you saw at the
Brick Manufacturers'
Convention is the
pyrometer you will
eventually purchase.



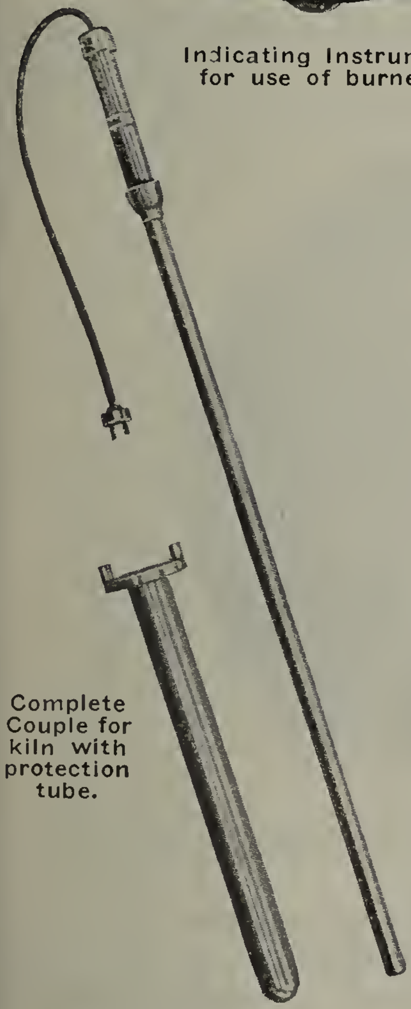
Three to twelve individual records made on one chart by one instrument.

BECAUSE

It will give you correct temperatures and records at all times, regardless of varying atmospheric conditions.

Can you stand for 100 degrees error in your pyrometer, especially at the Vitrification Period, and still get a good product?

When you have blamed everything else around your brick plant and still are not getting results: Look to your pyrometer.

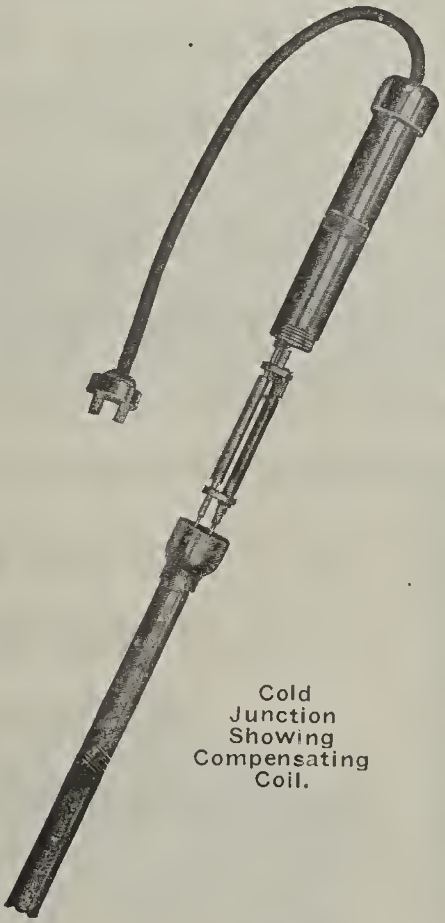


Complete Couple for kiln with protection tube.

If you have the

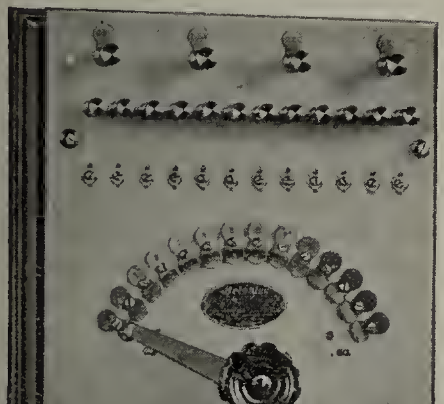
Beighlee Compensated Pyrometer System

You can bank on its readings
being correct.



Cold Junction Showing Compensating Coil.

Write us today for an estimate
on your special
requirements.



Switchboard.

The Beighlee Electric Company

Columbia Bldg.
CLEVELAND, OHIO

Gibb Instrument Co.,
Highland Building,
Pittsburgh, Pa.

Herman A. Holz,
Hudson Terminal Bldg.,
New York City.

Recording Instrument.

IRON & STEEL

KILN BANDS,
Rails,
Steel Plates, Bars,
Reinforcing Bars,
Shafting, Bolts,
Lugs, etc.
Forges, Blowers,
Blacksmith Supplies.

W. J. Holliday & Co.
Indianapolis, Ind.

The Three
Cardinal
Virtues in All
Brickmaking Equipment

EFFICIENCY
ECONOMY
STABILITY

These you have in the highest
degree in Brick Drying in

THE NATIONAL DRY KILN

INDIANAPOLIS, IND.

Write for Catalog,
mentioning The Clay=Worker.

ANNEX AND ANNEXERS.

(Continued from page 335.)

in Cleveland on the Ohio Clay Co. and Farr Brick Co. plants and the Cleveland Waterworks department. The souvenir pencil sharpener the company distributed was the most popular souvenir of the convention.

The C. and A. Potts and Company, Indianapolis, which has a large number of Potts sanders installed on the Cleveland brick yards was represented by George Potts. He received a number of inquiries as to their sanders and the Potts special self-striking horizontal brick machine. The latter has all visible working parts, front distribution, drop forged crank shaft, cut steel gears, large bearings, it being a heavy, powerful press with no light parts working in the clay. This concern furnishes everything necessary from clay bank to kiln in the soft mud line.

C. Hook and J. E. Wiltshire represented the Ohio Kiln Company, of Vigo, O. They have installed a number of their kilns during the last few months.

R. W. Newcomb and A. L. Terry exhibited in their room, 346, the Heraeus le Chatelier pyrometers, sold by the Englehard Company. They declared business was very good and prospects exceedingly bright. They equipped 186 kilns during the past year with complete installation.

W. H. Chappel, of the Beighlee Electric Co., Cleveland, Ohio.

The Beighlee Electric Co. had an interesting exhibit in room 327, where W. H. Chappel, W. H. Gibb and W. Little welcomed the visitors. Their indicating and recording compensated pyrometers of resistance and therom electric type were in operation. Their resistance system for dryers and their high resistance system for dryers and their high resistance galvanometer were featured. The Beighlee Electric Co. has fifty users in Cleveland alone.

The interests of the Ohio Galvanizing and Manufacturing Company, Niles, O., were handled by A. P. Dougherty and A. J. Bentley. These two gentlemen spent the week buttonholing the delegates and explaining the merits of the "Ohio" rolled edge brick pallet. This company makes these from 18-gage steel, ⅜-inch roll, running full length and across ends. This is claimed to be the lightest, strongest and most rigid pallet made.

The Philadelphia Textile Machinery Co. occupied Rooms 350-352. Here E. B. Ayres, Harold Copping and Raymond Keiser welcomed visiting clayworkers. There was an exhibit of photographs of the Proctor drying system, samples of brick, catalogs, etc. Souvenir pencils and cigars were presented. It is claimed for the Proctor dryer that it will dry clay ware in one-third to one-half the time of any other type of dryer, that it can dry some clays in 60 minutes and can dry any clay ware in the shortest possible time in which it can be dried with safety. There was a constant reception of delegates who displayed great interest in the system.

One of the most interesting exhibits shown at the Hotel Statler was the working demonstration of electric pyrometers by the Brown Instrument Company, of Philadelphia. In addition to the various types of instruments they have offered for several years in the past for measuring kiln temperatures, a new recording pyrometer was shown, capable of making eight records on the one instrument. This company has also extended its lines of manufacture to include indicating and recording thermometers for dryer temperatures. The general character of all these instruments indicates simplicity in their construction and operation.

The interests of the Chisholm, Boyd & White Company, of Chicago, Ill., were in charge of that congenial fellow, Harry Flood, who has attended a majority of the conventions in the last thirty years. His company manufactures the "Built Up to a Standard—Not Down to a Price" Boyd brick press, which is especially adapted to the manufacture of high-grade fire brick.

R. D. McManigal was button-holed by a number of the delegates, who wanted to know more about the McManigal grateless furnace. His office is at Logan, Ohio.

Chambers Bros. Company, of Philadelphia, known throughout the width and breadth of this country for its excellent line of clayworking machinery, had two old stand-bys at the convention—Mr. J. Howard Chambers and A. R. Root. Mr. Chambers reported the business of their company as being substantial, with a very bright outlook for this year's total business. Mr. Root, together with Secretary Randall, holds the record for attendance at the national convention. Both have attended every one of the thirty annual conventions.

A. R. Root, Philadelphia, Pa., Who Has Never Missed a Convention.

The Thornton Fire Brick Company, of Clarksburg, W. Va., had a display of their brick and block in the exhibition room. They certainly were good products, but, of course, we would expect that on any plant with which Marion Blair was connected.

The Schaffer Engineering and Equipment Company, Tiffin, O., represented by J. C. Schaffer and W. Crow, is a young firm in the clayworking machinery line which is making a name for itself. At present there is quite a demand for their poidometers, a machine used for measuring clays and other materials. They exhibited blueprints of their dryers, kilns, etc.

The Eagle Iron Works, Des Moines, Ia.—now can you guess who represented this well-known firm? Why, the old reliable, of course, L. Aulmann. He was there with bells on, and didn't lose any time in telling about the merits of the Eagle dry pan.

The representatives, D. E. Reagan and C. C. Walters, of the Hocking Valley Products Co. had Parlor A for their receptions and exhibits of samples of their rug brick, including

(Continued on page 370.)

GANDY

One Word---GANDY---
and What it Means

THIRTY-EIGHT years ago there was just one kind of stitched cotton duck belting made in this country.

That was GANDY.

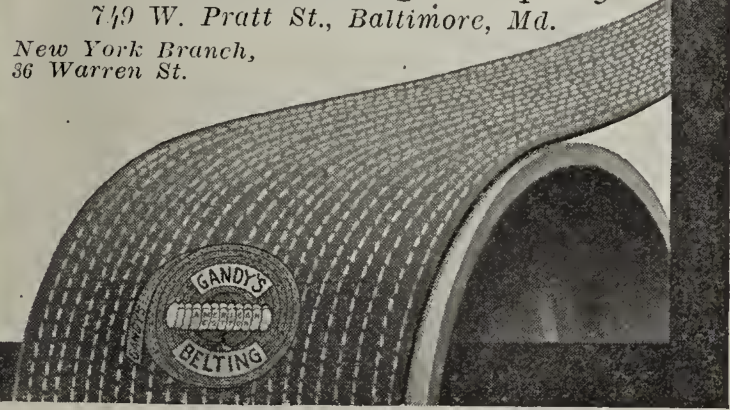
Then, and in following years, Gandy proved to be such a success that other concerns imitated it. They made cotton duck belting, too.

But Gandy was—and is now—so dominant in the whole belting industry that the name "Gandy" came to be used to designate *any* make of cotton duck belting.

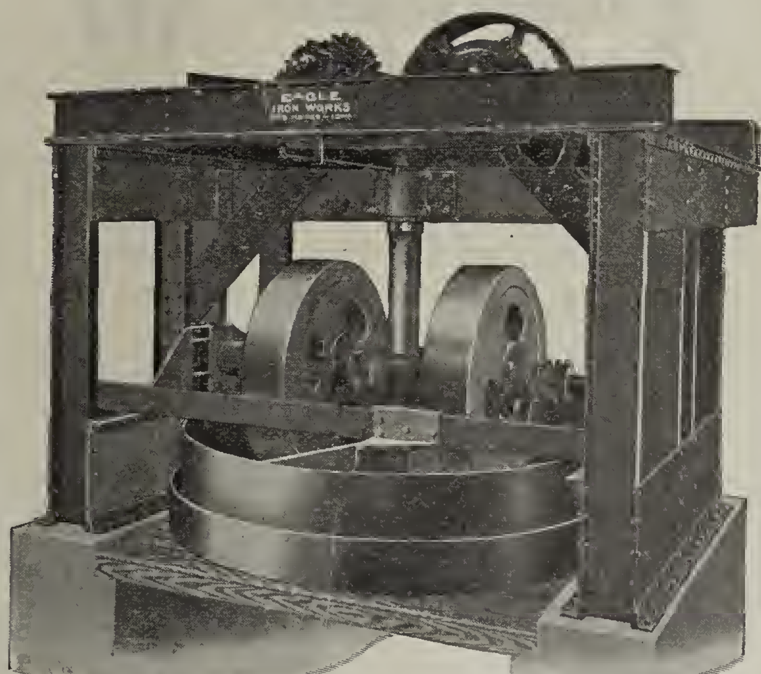
For this reason, belt users who realize that Gandy pre-eminence is due solely to its superior value should take extra precaution, not only to write the word "Gandy" into each belting order, but to examine the belting sent them to see that it has the Gandy trade mark stamped on it.

Write for sample and prices. There is no obligation.

The Gandy Belting Company
740 W. Pratt St., Baltimore, Md.
New York Branch,
36 Warren St.

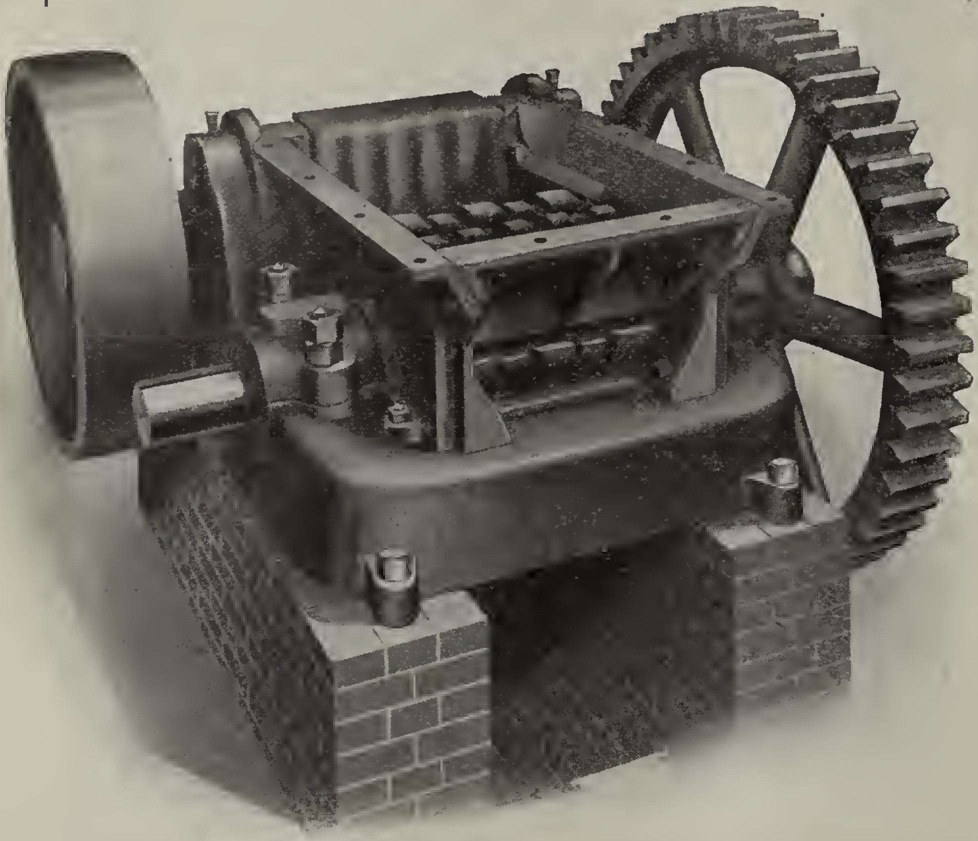


A New Candidate for Favor!
Right in Every Way!



The 8 Foot Steel Frame Dry Pan
Built by the
EAGLE IRON WORKS
Des Moines, = Iowa

MECO SINGLE ROLL ROCK AND SHALE CRUSHER



furnishes an

Invaluable
Indispensable Aid
Inexpensive

for ideal grinding conditions.

Saves labor and Dry Pan Maintenance.

It doesn't clog.

Its first cost is low and upkeep practically nothing.

We can not tell all of its good points in this space, but our booklet does it in a most clear and comprehensive manner. We court the privilege of sending you a copy.

The Manufacturers Equipment Co.
The Clayworkers Furnishing House
Dayton, Ohio, U. S. A.

Western Agent:
Geo. H. Smith, 510 Reliance Bldg.
Kansas City, Mo.

ANNEX AND ANNEXERS.

(Continued from page 369.)

their complete line in various shades. This company had a meeting of their 30 agents and representatives from various parts of the country at the Athletic Club February 23, where agency and sales matters were thoroughly discussed.

The merits of the Quincy clay gathers and plows were explained to the conventioners in the room of the Lechtenberg Bros., Room 418.

The Thew Steam Shovel representatives, D. D. Deeds, F. A. and C. B. Smythe, had a busy week dividing their interests between the Complete Building Show and the convention proper. They had an interesting display in their booth at the show, where they had an automatic photo cabinet filled with views of their shovels in operation. Excursions were made daily in which interested people were shown some of the 42 Thew shovels which were in operation in Cleveland. The business of this company was never better.

The International Clay Machinery Company, of Dayton, Ohio, successors to the C. W. Raymond Co., were well represented by two good button-holers, H. L. Erwin and C. W. Raymond. Pamphlets, catalogs and literature describing their large line were distributed freely.

The Lakewood Engineering Company displayed a full-sized standard side dump clay car and a double-deck dryer car in room 329. This clay car is the heaviest stock car manufactured. The company was represented by J. G. Benedict, F. H. Robinson, W. A. Meddick, J. H. Mosel, R. W. Tonzeau, H. T. Pleines and C. F. Lang. Our old friend Wadsworth was absent, being at that time abroad.

The Lakewood Side Dump Clay Car.

Did you get one of those centimeter cigars that had a gurgle in it—the Roessler-Hasslacher Company presented the delegates? They cured many a cold, convention week. The doctors were Otto W. Will, Perth Amboy; Werner Malsch, Walter Schaffer, Geo. Barlow, Ed A. Brockman and H. W. Smith, New York, and C. H. O'Hara, Cleveland. These doctors also administered doses of information relative to the merits of the Roessler-Hasslacher chemicals, oxides, etc.

The entire force (and it was some force) of the L. E. Rodgers Engineering Company came over from Zanesville and put in a busy week. Mr. Rodgers believes 1916 is going to be a wonderful year for his company, for he has a number of big orders on hand. He has built some of the finest plants in the country, and the Rodgers dryer has always proven successful. Some of this company's latest orders booked were for the Streator Clay Manufacturing Company, Streator, Ill.; Clay Products Company, Brazil, Ind., and Dover Fire Brick Company, Strasburg, Ohio.

The representatives of the Arnold-Creager Company, J. F. Aten and Frank McClelland, were button-holed continually for information relative to their new S. S. S. special machine, that sand molds, puts molds back in machine, strikes them off, bumps them, dumps them, puts mold back in sander, takes pallet of brick out to one side, where it can be picked up and put in car or put onto a cable system. Mr. McClelland has the record of being the oldest soft-mud brick machinery salesman attending the conventions.

The Mathews Gravity Carrier Company, of Pennsylvania, was represented by its Cleveland agent, R. F. Kumler. Its gravity carrier system is used on a number of the Cleveland plants, being a most economical way of taking the product from kiln to car.

The Westinghouse Electric and Manufacturing Company, Pittsburg, Pa., had two men at the convention—W. H. Artz and T. A. Klinefelter. All questions relative to installation of electrical equipment on clay plants were gladly answered by these gentlemen.

The Marion Machine, Foundry and Supply Company, of Marion, Ind., had a model of their Shear Klean grate and their Rust clay feeder on exhibition in the exhibition hall. Mr. R. E. Young and Mr. M. B. McFeeley ably represented this well-known company.

The Hook Patent Kiln Company was well represented by H. P. Jenks, who exhibited sectional drawings of his patented kiln in Room 328. It is claimed for this kiln that it not only improves the quality of the ware, but makes an effective saving in fuel, time and labor. Many of these kilns have been erected on plants in various parts of the country and are giving entire satisfaction.

E. M. Freese & Co., Galion, O., manufacturers of D. M. of P. E.—meaning, per their latest catalog, Dependable Machinery of Proven Efficiency—had good team work the entire week. B. E. Place, H. H. and A. J. Freese, E. L. and G. R. Hess and E. W. Dow, the representatives, welcomed the delegates in their rooms, 341-343-345, distributed catalogs and a general line of literature, and presented most acceptable black leather pocketbooks. This company has had a busy season and thinks the spring orders will be more than satisfactory.

The Ceramic Supply and Construction Company, represented by W. D. Richardson and H. C. Arnold, held open house in room 1034. Here were exhibited colored prints and photos of the Richardson producer gas fired continuous kiln and the automatic coal fired continuous kiln. The delegates showed great interest in these kilns, as they did also in the rattler, clay feeder and draft gage. A model of the clay feeder was displayed, while a full-sized draft gage, with connections, was shown for ocular demonstration. Attractive literature on their several products, including letters highly recommending their screens, feeders, bucket elevators and testing and controlling apparatus, was distributed. The writer enjoyed one of their good cigars.

Mr. P. V. Wheeler had charge of the interests of the Link Belt Company at the convention in Room 331. He had on display photos of the silent chain drives in brick plants, a small model of a link belt conveyor run by motor, a partial list of clay working concerns using Link Belt silent chain drives, catalogs, pamphlets and samples of chain. A souvenir folding foot steel rule was presented the visitors.

Messrs. J. W. Cushing, E. W. Kingsbury, J. M. Hallissy, J. H. Reside, L. S. Scott and J. K. Lutz had in charge the interests of the Scandinavia Belting Co., in Room 342. They displayed catalogs, photos of conveyors, elevating and transmission belting, samples of belting, belt fasteners and belt dressing. The Crescent Belt Fasteners Co.'s line is handled by this company, as is also the Allegator fasteners of the Flexible Steel Lacing Co.

C. B. Thwing had little time for anything outside of business convention week. He was in constant demand in room 344 where delegates inquired as to the advantages of the Thwing pyrometers. He had an exhibit of multiple record high resistance pyrometers for all temperature from liquid air to the carborundum furnace. He had on display a model showing operation of automatic switches by means of which six records are made by a single instrument also an exhibit of thermo couples and portable pyrometers. On the walls appeared sample temperature charts made at a number of plants which had been supplied since the last convention.

(Continued on page 372.)

The Hook System of Burning

is installed in a large number of plants throughout the United States and Canada. In northwestern Ohio alone 65 companies have purchased the Hook System.

65
Count 'em
65

The expense of converting old round or rectangular kilns to the Hook System is comparatively small, and new kilns cost no more than kilns of common type.

We can furnish plans, send masons, or will contract to build your kilns complete.

Better use the Hook System, improve the quality of your ware and eliminate excessive waste.

TELL US YOUR TROUBLES.

HOOK PATENT KILN CO.
VIGO, OHIO

Increase Production

IN YOUR PITS

BY BLASTING CLAY

With Low-Freezing

DU PONT

Quarry Powder

A New, Powerful, Quick-Acting
Explosive Especially Made
for Clayworkers

THIS explosive meets the requirements for an "all-round powder" for clay pit work. It has the low-freezing property which makes the thawing of explosives seldom necessary.

Insist that all blasting be done with DU PONT QUARRY POWDER, or low-freezing explosives tntroduced and made by the pioneer powder makers of America.

Ask for copy of our new booklet "BLASTING CLAY PITS," giving practical information about the use of DU PONT EXPLOSIVES in clay pits.

ADDRESS DEPT. 296.

E. I. du Pont de Nemours & Co.

Powder Makers Since 1802

WILMINGTON, DEL.

ANNEX AND ANNEXERS.

(Continued from page 371.)

Mr. Thwing stated that a growing interest in pyrometers was shown by the fact that he equipped more plants during the last year than in all of the previous three years. Mr. Thwing presented the visitors with a neat clay blotting stone.

One of the most interesting exhibits at the convention was that of the Aspha-Bric Corporation. John Baker, Jr., president of the company, had arranged an elaborate display and personally conducted the campaign for recognition of this newest of paving materials. Mr. Baker was assisted by twelve western members of his organization, including L. R. Mackenzie, William Howe and Theodore C. Jacoby, who are well known to the majority of paving brick manufacturers. The display occupied the state suite and adjoining parlors at the Hotel Statler, and consisted of paving brick from different parts of the country which had been treated with the Aspha-Bric process. These were placed alongside the untreated brick. Speciments of both the treated and untreated brick had been subjected to a standard rattler test, and these were also placed side by side. The comparison evidenced by the eye was substantiated by the reports of a firm of qualified engineers, under whose supervision the various tests had been conducted. The display held a point of special interest to any one connected with the paving industry since it showed in combination what for years have been admitted to be the two standard paving materials—asphalt and brick. However, the magnet which both drew and held the brick manufacturers, is best told in the slogan of the Aspha-Bric delegation—"Turn your cull pile into profit." The exhibit was very largely attended and more than lived up to the advance promise of its supporters that it would prove "the surprise of the convention."

Other firms represented at the convention were Steadman and Robinson, New York; The Main Belting Co., Buffalo, N. Y.; Harshaw Fuller and Goodwin Co., Cleveland; Fan Co., Kalamazoo, Mich.; Dodge Sales and Engineering Co., Mishawaka, Ind.; The Youngstown Steel Car Co., Youngstown, Ohio; R. D. Nuttall Co., Pittsburg, Pa.; Price Pyrometer Co., Cleveland, Ohio.; C. O. Bartlet & Snow Co., Cleveland, Ohio; Cleveland Alloys Co., Cleveland, Ohio; Frank Pyrometer Co., Lancaster, Ohio; General Electric Co., Schnectady, N. Y.; Imperial Belting Co., Columbus, Ohio; National Belting Co., Cleveland, Ohio; Sanderson Cyclone Drill Co., Orrville, Ohio; Canton Grate Co., Canton, Ohio; Green Engineering Co., Cleveland, Ohio; Veritas Firing System, Cleveland, Ohio; Hewitt Rubber Co., Buffalo, N. Y.; Ohio Motor Co., Sandusky, Ohio: C. H. Horton Co., Zanesville, Ohio; Samson Interlocking Tile Co., Shallow Lake, Ont., Can., and J. A. Pardine Co., Erie, Pa.

ADVERTISING NOT A SHOESTRING GAME.

"From a standpoint of business the main question is—Advertising. In the roofing trades conditions are peculiar in that some roofing materials are widely advertised while others are not, and the demonstration is complete—the advertised roofings are fast coming to the front, while the non-advertised are falling behind. The evidence is too plain for argument—the prepared roofings are crowding out other materials because they are extensively advertised.

"It is amusing to watch the antics of the shingle men, for example, under pressure of competition from other roofing materials. They hold conventions and adopt resolutions to the effect that shingle roofs are good roofs, and some one among them has the courage to suggest that they appropriate a lump sum for advertising. An effort is made to do this, and possibly a small amount of money is raised and part of it is paid to lumber trade publishers for ads to lumber dealers. Meantime the prepared roofing manufacturers are spending ten times as much in a carefully planned campaign that brings business, and the shingle men complain that they are being crowded out by 'substitutes.' We wonder if they will ever wake up to the fact that advertising is a serious matter and that it cannot be done successfully on a shoestring."—The American Roofer.

Are we going to leave the brick boosting business in shape to have the same kind of fun poked at it, or not? That is the question of the day.

ARE YOU MAKING MONEY OR JUST MAKING BRICK?

A PROMINENT MANUFACTURER recently remarked: "I believe the paving brick industry of the country, taken as a whole, is on a losing basis." If this statement is true, we are all responsible, those of us who are and those of us who are not making money. This condition can be corrected and must be, if the industry is to continue to occupy the position of prominence it has already attained.

The publicity associations supported by the manufacturers are becoming more efficient each year, but they cannot be expected to make the industry a financial success if we, as manufacturers hide our heads in the sand and refuse to help ourselves, nor can we support these associations as generously as we should, unless our business is handled at a profit.

The day of price fixing and the extravagant methods accompanying it is past, and, therefore, all industry, in order to be successful, must be on a proper economic basis.

The Institute of Paving Brick Manufacturers will meet in Portsmouth, Ohio, on the 12th day of April. Mr. C. C. Blair, secretary and general manager of the Bessemer Limestone Company, will lead a discussion on "Cost Keeping," and the men in charge of the cost departments of a number of companies have signified their intention of attending the meeting and taking part in a frank discussion of this most important subject. If we all knew our exact costs, our selling prices would automatically set themselves. Our "Competition might still be keen, but it would be no longer ignorant."

Having had the unusual opportunity of examining the cost sheets of most of the larger manufacturers of paving brick, the writer is of the opinion that a comparatively small amount would cover the actual difference in their costs per thousand or costs per ton. This in spite of the fact that the figures show a considerable difference.

There is a peculiar form of pride possessed by most of us which makes us rather hide our costs than show them. If there is any one operation or motion in the process of manufacturing paving brick, which we accomplish cheaper or better than our competitors, we are usually more than willing to tell about it, but our complete cost sheets as a rule contain items which we are reluctant to expose, and are the occasion of shame rather than pride. The extravagances fully talked over might be the means of new economies.

It has often been said that every manufacturer of paving brick loses one dollar per thousand somewhere in his process of manufacture. Do you know where you lose yours? If not, have you any way of finding out where you lose it?

An Irishman who killed his landlord went the next day to confession, and was met coming out of the church by a number of his curious friends, who asked: "Pat, what did the Father say to you when you told him you had killed the landlord?" Pat replied: "I came here to confess my sins, and not to boast."

If we all go to Portsmouth with the idea in mind of telling each other a few of our weaknesses, as well as our virtues, it will undoubtedly be a very profitable meeting, and possibly the nucleus of a reform in our cost keeping system.

Some manufacturers in other lines have gone so far as to adopt uniform cost keeping systems, which have been of inestimable value. At the present time it is almost impossible for two paving brick manufacturers to get together and compare costs intelligently, as no two keep them in the same way nor include in them the same items. They cannot both be wholly right, and the chances are that the one showing the lowest cost may be fooling himself, which is known as "kidding on the square."

Mr. Peebles, of the Peebles Brick Company, has extended to us a cordial invitation to visit his plant, and it is the desire of the Paving Brick Institute that all members make an earnest effort to be present, and the institute extends to those who are not members an invitation to the meeting and a participation in the discussion.

We ask every one interested to come to Portsmouth on April 12 and to come prepared to talk, look and listen.

INSTITUTE OF PAVING BRICK MANUFACTURERS,
By Wm. Geo. D. Orr, Chairman Program Committee.

IT'S A REPEATER

THE IMPROVED HOOK PATENT UP AND DOWN-DRAFT SYSTEM

Burns With a Uniform Hardness Throughout Kiln.

Mars, Pa., Feb. 25, 1916.

To Whom It May Concern:

We have installed in our 30-foot kiln the IMPROVED HOOK PATENT UP AND DOWN-DRAFT SYSTEM, and are convinced that it is the only system by which brick can be burned as hard at the bottom as at the top in less time and with less fuel.

Since our burn in the first kiln, and the burn giving satisfactory results, we have decided to erect another of the same kind, as the IMPROVED HOOK PATENT UP AND DOWN-DRAFT KILN has every advantage over our former kilns.

MARS BRICK AND TILE COMPANY,
Per Chris Gelbach.

We base our claims on what others are doing with our system, and where economy of fuel, saving in time, and production of ware count.

NO OTHER SYSTEM LIKE IT.

—Sold only by—

OHIO KILN CO., Vigo, Ohio

ANNOUNCEMENT

MR. C. HOOK
Inventor and Patentee of
the IMPROVED HOOK PATENT
UP and DOWN-DRAFT KILN.

We have been asked, and repeatedly asked to explain the difference between Ohio Kiln Co. and Hook Patent Kiln Co. We wish to announce to the clayworkers, that Ohio Kiln Co. and Hook Patent Kiln Co. are two separate companies, and Mr. C. Hook is in no way associated with Hook Patent Kiln Co., having severed his connection with this company in June, 1914.

He is now associated with Ohio Kiln Co., enjoying the pleasure of selling his latest patent kiln, which has exceeded his own expectations. When co-operating with Ohio Kiln Co. we assure you that you will receive Mr. C. Hook's personal attention, as well as his 28 years' experience in designing of kilns, and the actual manufacturing of clay products.

OHIO KILN CO., Vigo, Ohio

Used by Thirty-Seven Different Plants

Grateless Gravity Feed Fireboxes

are being installed today on the plant of the Sioux City (Ia.) Brick & Tile Co., manufacturing face brick, common brick and hollow ware; also at the Flint Brick Co., of Des Moines, Iowa, which manufactures paving brick.

Here is what Mr. John Sehy, of Ashland, Ill., says:

"About two years ago I settled a lawsuit with my neighbor for smoke nuisance, by installing the Grateless Gravity Feed Firebox, which has done away with the smoke in a satisfactory way for my neighbor, and also has been a business proposition for me in saving fuel and burning better ware, and in general has been most satisfactory in every way."

Send at once for our pamphlet

Grateless Furnace Company

FUEL ECONOMISTS AND ENGINEERS

DES MOINES, IOWA

PYROMETERS

A Brown Pyrometer on your kilns will pay for itself in two months in the saving in fuel alone, not to mention better ware produced.

Send for 56 page Catalog No. 17

BROWN INSTRUMENT CO.

PHILADELPHIA, PA.

New York Pittsburgh Chicago

OREGON CLAYWORKERS' ASSOCIATION HOLDS ITS SECOND ANNUAL MEETING.

Success of Organization and Mutual Benefits Are Fully Realized.

THE Oregon clayworkers were organized a year ago. Held four meetings within a year, and the spirit displayed among the members points to continued success. In the first meeting the idea of suspicion of the fellow clayworkers was quite apparent. This has entirely disappeared, and every member is now working for his mutual benefit.

Among the members present a great deal of good was accomplished, and the loss sustained by absence will be felt by those clayworkers who stayed at home.

The following new officers were elected: Mr. Harold S. Smith, manager of the Denny-Renton Clay and Coal Co., of Portland, as president; Mr. Phil Withycombe, of Yamhill, was re-elected vice president; Mr. S. Geijsbeek, of Geijsbeek Engineering Co., of Portland, was re-elected secretary-treasurer, and Mr. C. G. Rawlings, of Albany, was elected as a director on the board to serve two years. Mr. T. S. Mann, of the Pacific Stoneware Co., of Portland, was the hold-over member of the board. The financial condition of the association is in good shape, and shows a surplus for the year's operation.

The advertising matter was brought a step further to realization when it was voted to refer the matter back to the board for prompt action. The fund subscribed is now nearly $400 for an educational advertising movement. The educational committee was continued after its report was read and adopted. A new committee, consisting of the president, Mr. Smith, Mr. Mann and Mr. Rawlings, was appointed to bring the matter before the Governor of the state and also before the Board of Control in the matter of prison-made brick competing with the brick made by the members of the association. made by the members of the association.

The routine business was disposed in the first session, and the evening session was used for the reading of the various papers. Mr. J. Penfield, City Engineer of Albany, spoke about the co-operation of the drainage engineer and the tile manufacturer. Mr. H. S. Wheeler, of the Far West Clay Co., of Tacoma, gave some very valuable information about hollow tile die construction, which also applied to drain tile manufacturing.

Co-operation among the members was the subject of Secretary Geijsbeek. He showed the members that one of the first things they should do is standaridze their cost finding systems, for in that way every member would know what it cost him to manufacture and it would give them an idea of what price they have to charge in order to make profits on their manufacturing. The topic was discussed at length, and it was the sense of the meeting that the association foster such work among the members.

On the second day the members in a body went by train to Corvallis, where the last session was held at the Oregon Agricultural College in the Mines building. The delegates were met at the depot by State Mines Bureau officials and conducted to the campus. Professor Parks, as director of the State Bureau of Mines, gave a talk about the mineral prospects of the clayworking industries, which was very interesting. Professor Williams, as head of the Ceramic department at the college, gave a lecture about the Burning of Clayware. The practical view which Professor Williams gave to his talk was of great benefit to all members, and will assist greatly in overcoming some of the burning troubles of various plants.

Professor Powers, of the Drainage School, urged the tile manufacturers to assist as much as possible in establishing the various drainage districts, and outlined what the state will do this year in that work.

Professor Graf, of the Experimental Engineering department, read a paper on the strength of brick and tile, which was greatly appreciated, as it gave the members some idea of what strength and demand their products were subjected to.

Before final adjourning, the meeting voted thanks for the college and the faculty for their interest in the matter. The laboratories of the Clayworking and Ceramic department and also of the Experimental Engineering were visited after the meeting.

The board of directors will decide when the next meeting will be held, but it will probably be held early in June, and will include trips to several of the clay plants. McMinnville and Willamina are most likely to be visited then.

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Dries in ten hours.
No live steam.
All heat from exhaust steam [or waste heat.
No cracked brick.
No whitewash.
No clay too tender.

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2 6 d

FOR SALE.

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Good prospects to obtain business management.

Stock for sale in this brick factory in any amount. For particulars write to

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2 1 cm

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One type "O" Thew automatic shovel, shop number 687, bought February, 1912. Only used to dig about 18,000 yards of clay. In splendid second hand condition. Price, $2,500.00 F. O. B. cars Memphis, Tenn.

Also six Quincy clay gatherers in fair condition, $100,000 each F. O. B. cars, Memphis, Tenn.

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2 3 cm

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1 Stevenson wood frame 9-ft. dry pan.
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1 Freese automatic rotating cutter.
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3 3 cm

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Splendid opportunity for right man.

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FOR SALE.

1 American upright soft mud brick machine and pug mill, complete with clutches.
1 Friction hoisting drum.
1 Thirty-five h.p. portable boiler.
About 20,000 10x34-inch brick pallets.

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WANTED, ETC.

WANTED.

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WANTED.

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Position as superintendent of paving, front or hollow block plant; first-class burner, any kind of kiln; thorough experience in running and upkeep of machinery and handling men. Best of reference.

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FOR SALE.

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Two cut-off tables, one winding drum and freight elevator. All in good condition.

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(Continued on next page.)

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Give our power engineers a hearing. Their services are free.

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Fifty to 100 castiron two-deck dryer cars, 24-inch gauge.

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BEST QUALITY MANGANESE, CAREFULLY AND UNIFORMLY PREPARED FOR BRICKMAKING. WRITE US FOR SAMPLES AND PRICES.

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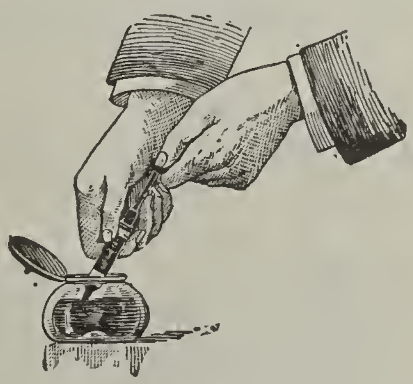

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ALFRED YATES,
SHAWMUT, PA.

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(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

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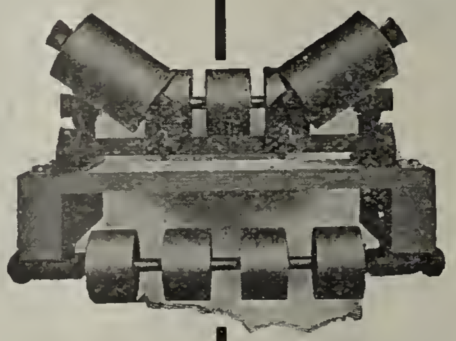

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We manufacture Complete Handling Equipments.

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CLAYWORKING ENGINEER

2803 N. Kings Highway
ST. LOUIS, U. S. A.

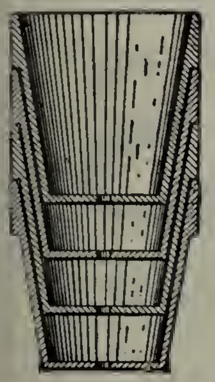
30% Average Cash Dividends

Did you ever investigate the **proven** high profits, assured safety and permanence of Silver Black Fox Farming?

Get the facts, then judge for yourself—not before. Unusual opportunity is offered to invest from $100 upwards on ground floor basis in conservatively capitalized, well managed company.

Send for prospectus which gives full facts, government reports, etc. Write promptly, as there is only a moderate amount of stock for sale.

Adirondack Ranch Co., Ind.
109 Arcade Bldg., Utica, N. Y.



Make Money

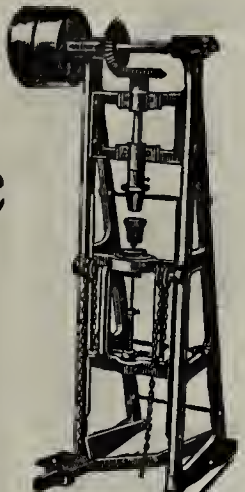
WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
1801 English Ave. INDIANAPOLIS, IND.



New Books Which Are Being Offered To the Trade:

HOLLOW TILE HOUSE, by Fred'k Squires, Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

CEMENT, CONCRETE & BRICK, by A. B. Searle, Price, $3.00.

A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

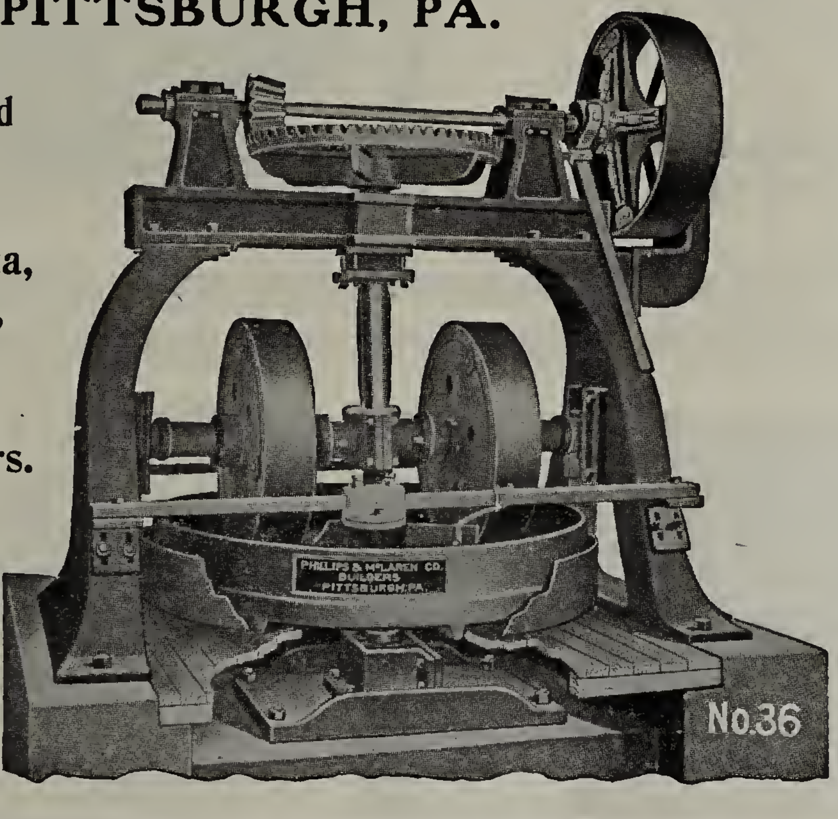
PHILLIPS & McLAREN CO.

PITTSBURGH, PA.

Builders of
Pittsburgh Standard
Dry and Wet
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office
Stephen Girard Bldg.
Philadelphia, Pa.



$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) **$2.00**

Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.
EASTON, PA., U. S. A.

Correspondence solicited.

Chattanooga Paint Co.,

Chattanooga, Tenn.
Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

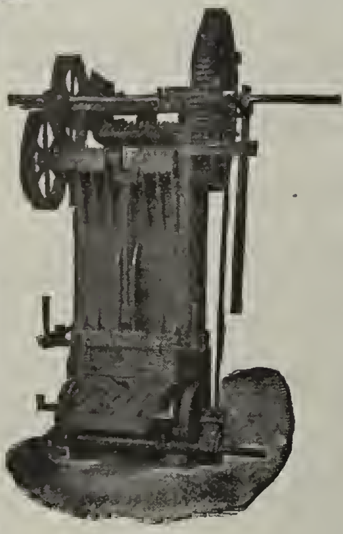
RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

FOR SALE.

Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

T. A. RANDALL & CO.,
Indianapolis, Ind.

MODERN CLAY-WORKING ENGINEERS



And Builders
of Complete

BRICK MAKING PLANTS

For Either
Soft or Stiff-Mud
Processes.

Steam Power
50 Thousand
Animal Power
20 Thousand

We Build the
Most Complete
Line of Yard
Supplies and
CRUSHERS

THE HENRY MARTIN BRICK MACHINE MFG. CO.
LANCASTER, PA., U. S. A.
Get Our Big Catalog.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

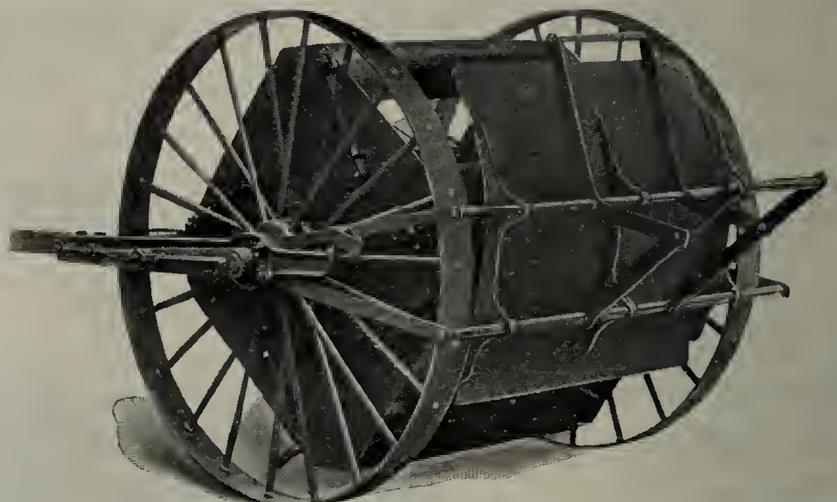
We guarantee it. Write us today.

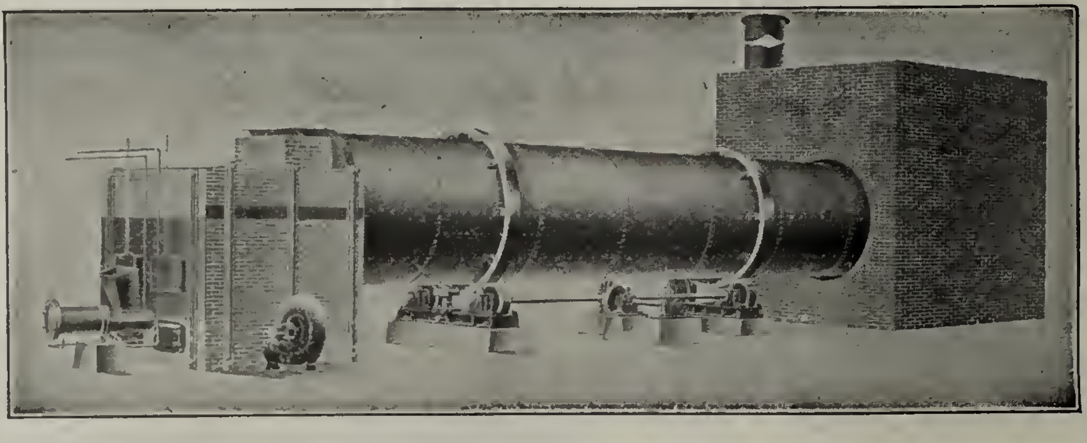
DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

THE QUINCY IMPROVED GATHERER

used in connection with our **SPECIAL CLAY PLOW** is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
Quincy, Ill.





ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

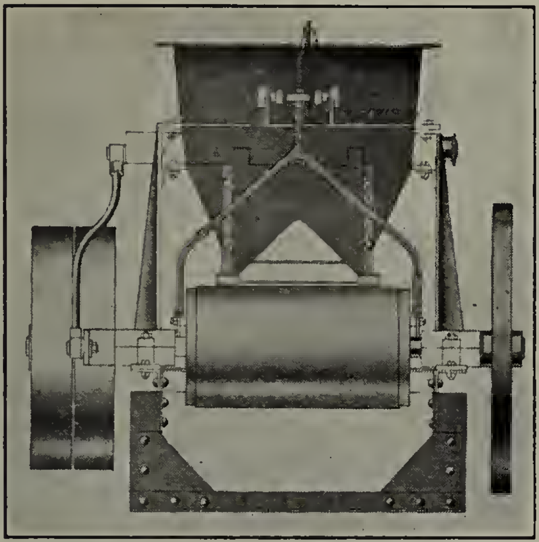
It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
NEW YORK

The Schaffer Poidometer

PATENTED



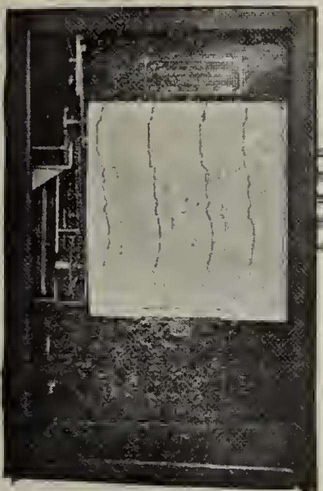
The Poidometers automatically temper the clay. They unite any number of materials in correct proportions. They weigh the materials, measure the water and deliver them in a predetermined quantity per minute in an even, constant flow.

They cause a uniform column of clay to flow from the brick machine at a regular speed.

INVESTIGATE AND
INVEST IN THESE MACHINES.
IT WILL PAY YOU.

The Schaffer Engineering & Equipment Co.
Tiffin, Ohio

The More Knowledge; The BETTER RESULTS



Catalog No. 3242
Eight Records on One Chart

It is obvious that the more you know about firing conditions in your

KILNS

the better you can control the burning of your product. It follows, therefore, that the pyrometer outfit which will enable you to secure the most information for the money is the most economical outfit to purchase.

TWINKO Multiple Record Recording Pyrometers permit the recording of more data from more points in one kiln, or from a larger number of kilns, on a single record chart than any other make of pyrometers.

That is why they are being so universally adopted.

Tell us how many kilns you fire at one time, and we will submit a proposition that will delight you.

Thwing Instrument Company
439 N. 5th St. Philadelphia, Pa.

Books for Brickmakers

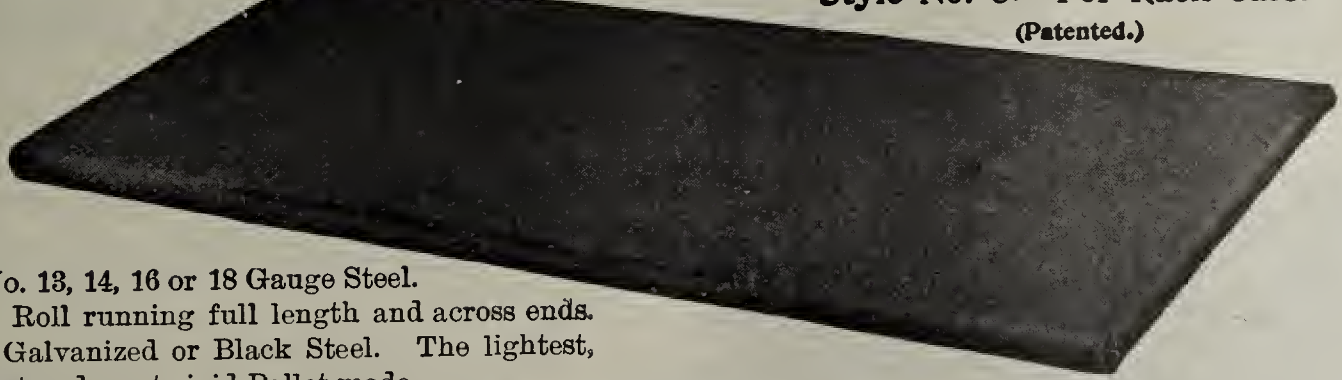
"CLAY GLAZES AND ENAMELS," H. R. Griffen	$5.00
"CLAYWORKERS' HANDBOOK," by Author of "Chemistry of Clayworking"	2.00
"CLAYS," Heinrich Ries	5.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M.	2.00
"PRACTICAL FARM DRAINAGE," C. G. Elliott	1.50
"ENGINEERING FOR LAND DRAINAGE," C. G. Elliott	2.00

Mailed, postage free on receipt of price.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)



Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio

MR. CLAYBURNER

If you reduce radiation from crown and walls of kiln you save time and fuel. If you increase life of linings and prevent rust and corrosion on dryer cars, fans, pipes, etc., you save costly renewals. You can do these things with Carbide Coating at a nominal cost.

You may not believe that a coating or paint will protect linings. You, however, believe that salt glaze or a vitrified surface protects pipe and brick. Well, the pigment in Carbide Coating will endure heat that will burn up, vaporize fire brick and the vehicle or binder is the same article you get in salt glazing at the vitrifying temperature. The combination forms a composition which will protect linings, reduce radiation and protect metal from acid, sulphur and other corrosive fumes.

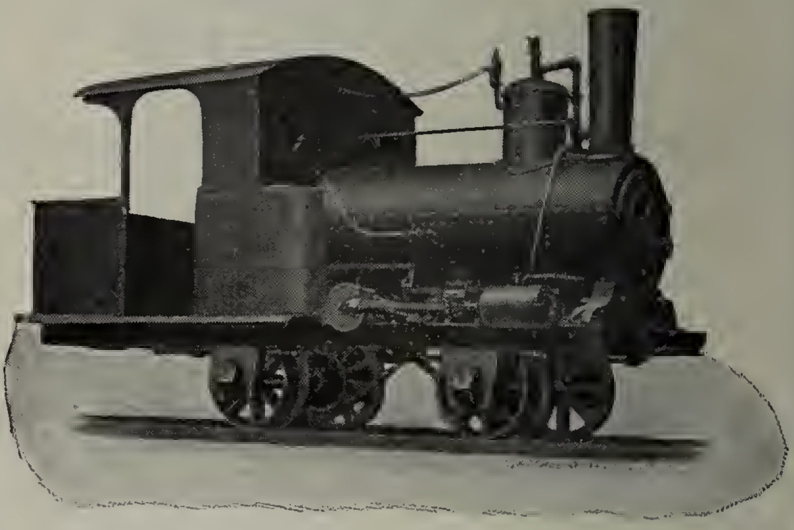
I will be very glad to show you how you can use this to advantage. Address,

E. R. STOWELL,
Oden, Mich.

INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

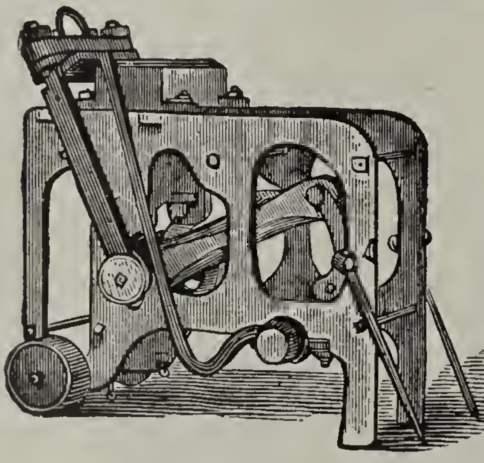
The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

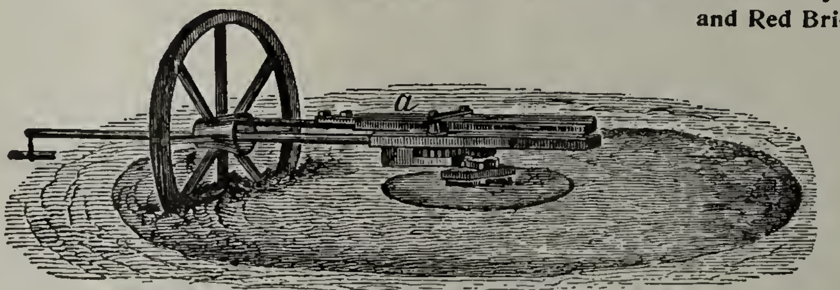
Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



RED BRICK PRESS.

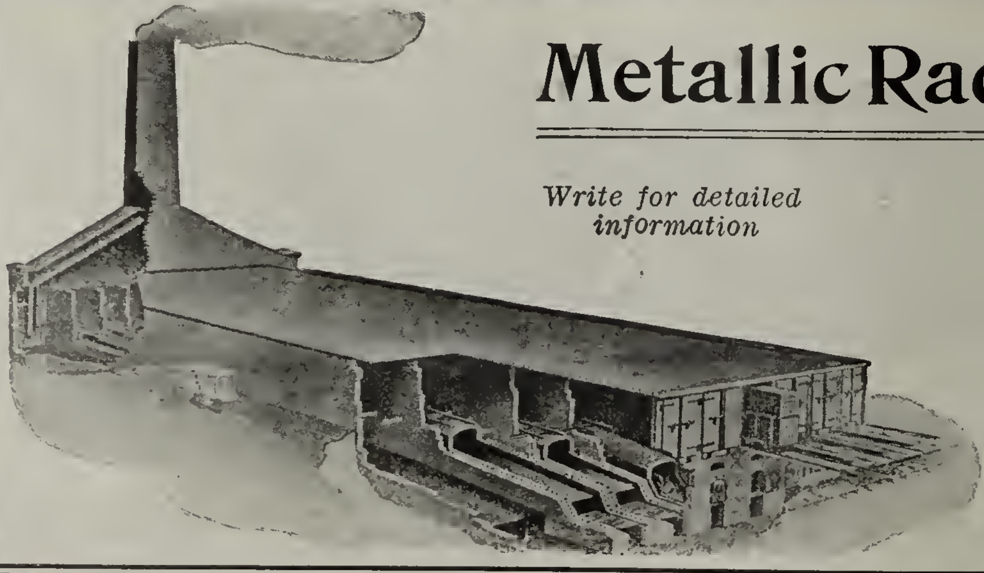


These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞ Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

Metallic Radiation Heat Dryers

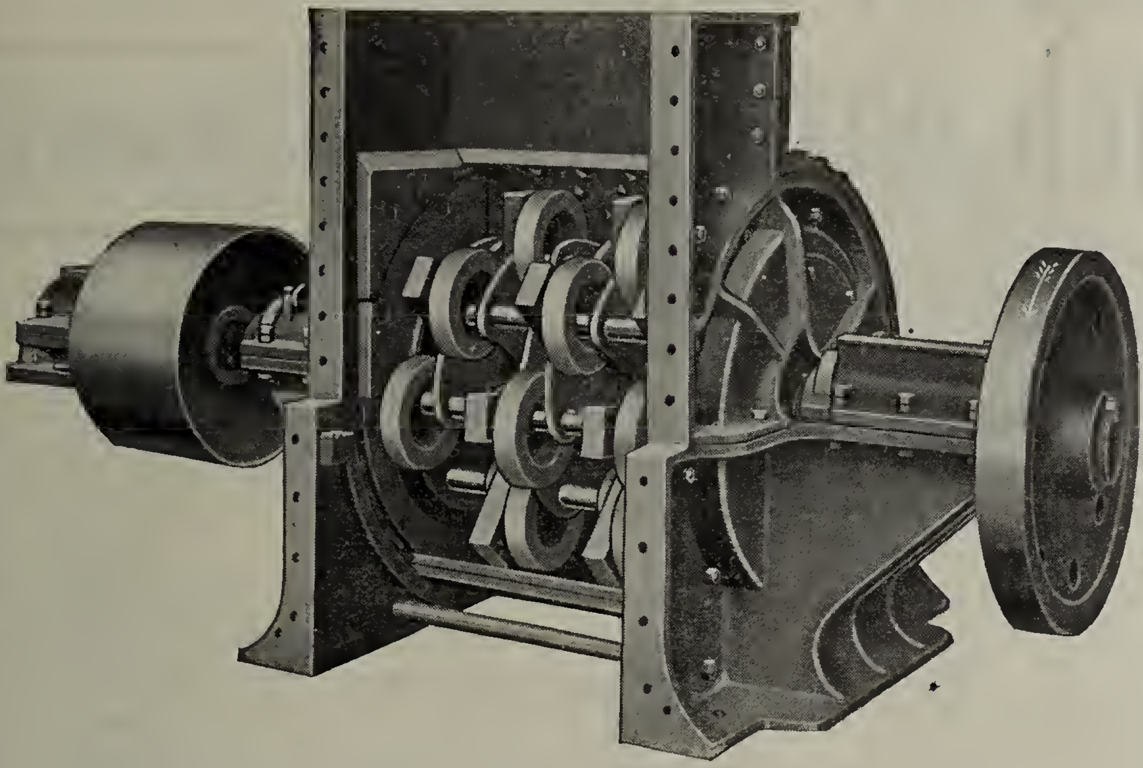


Write for detailed information

What Competitors and Others are saying about our Metallic Radiating Heat Dryers: Best in the Universe—they take in a good bit of scenery.

Patented
No. 704,418 July 8, 1902. No. 930,587 August 10, 1909.
No. 721,988 March 3, 1903. No. 956,789 Jan. 11, 1910.
No. 1,027,513 May 28, 1912, by

Thomas M. Wilson
5116 Walnut St. Philadelphia, Pa.



IMPROVED MODEL

Disc removed from the grinding room of the machine and installed in offsets in housing sides.

Inner housing sides lined with 1¼-inch thick chilled iron liners.

Rings and hammers overlap, thereby total grinding surface utilized.

UPKEEP DECREASED

CAPACITY INCREASED

The Decatur Brick Manufacturing Company, Decatur Ill., installed our largest Pulverizer, season 1913. We are now building them another of like size. Merit has won against all competitors.

Buy the best. You will win. Catalog on request. Describe your material. State tonnage and screen mesh fineness.

AMERICAN PULVERIZER CO., East St. Louis, Ill.

Over 300 Brick Manufacturers Using Thew Shovels

42 Thews in Cleveland.

Ask The American Building Brick Co.; The Barkwell Brick Co.; The Cuyahoga Brick and Shale Co.; The Deckman-Duty Brick Co.; The Farr Brick Co., and *The Ohio Clay Co.* what they think of their *Thews.*

The First Thew Shovel Still in Service.

Let us show you *Thews operating* that have been *in continuous service over 15 years.*

Last year the sign read 37 Thews in Detroit.

The Thew Company refers you to any Thew Shovel owner anywhere.

They do this because the *policy of the Company will not permit a Thew* to *be sold to any one unless* it *can give good results.*

The *Thew reputation for fair dealing* is *too valuable to sacrifice for a few orders. If the Thew cannot help you, they do not want you to have one.*

Here is what the owner of the *first Thew Shavel* says after it has been *in continuous service over 21 years: "No better shovel was ever put up. It is not very handsome to look at, but it is very economical in operation and does its work without any trouble. We can't say anything too good about the shovel."*

Use a Thew==It Pays.

Write for Circular 22=F.

THE THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

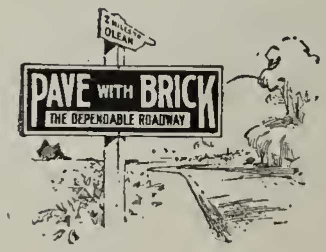
JOIN THE

BOOST BUILD WITH BRICK BOOST

CAMPAIGN

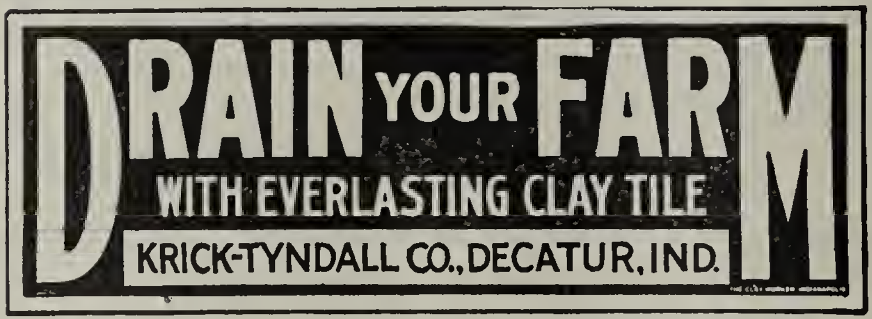
A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.



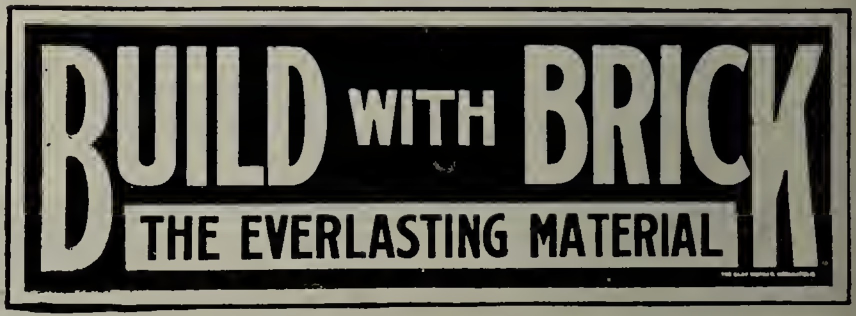
IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

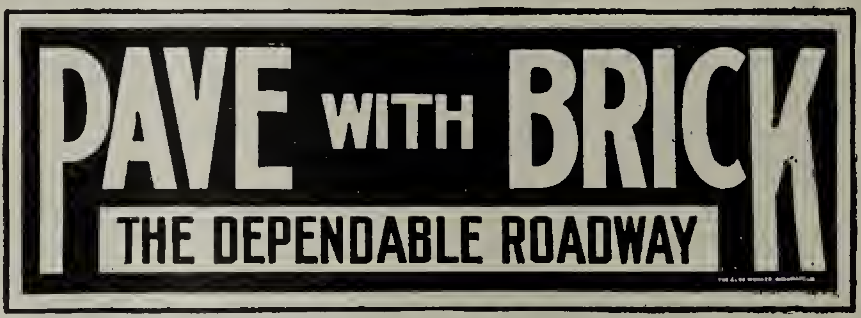
Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.



It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background.





These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $5.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $6.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

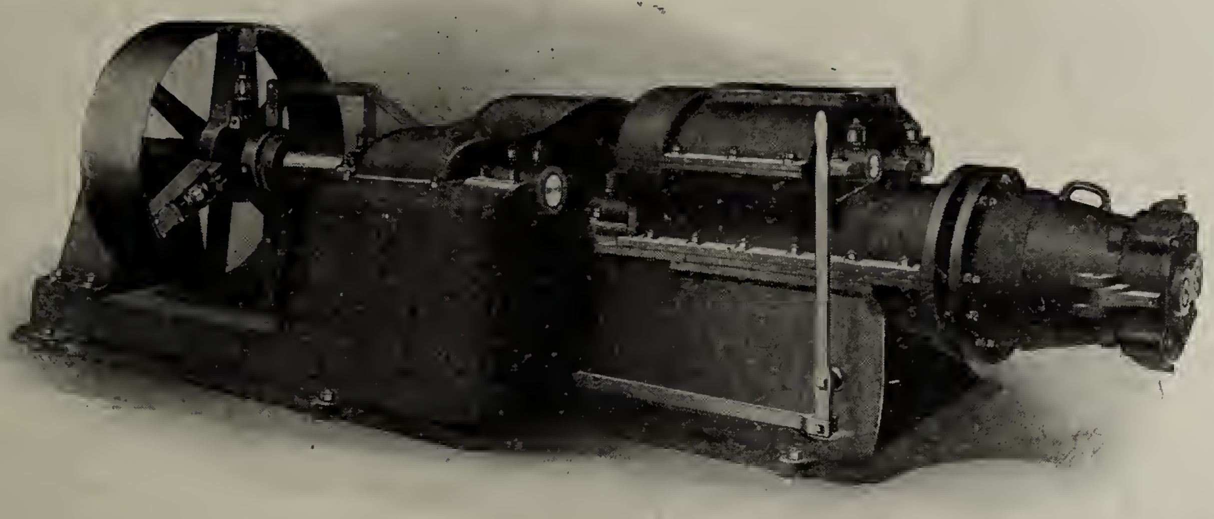
Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

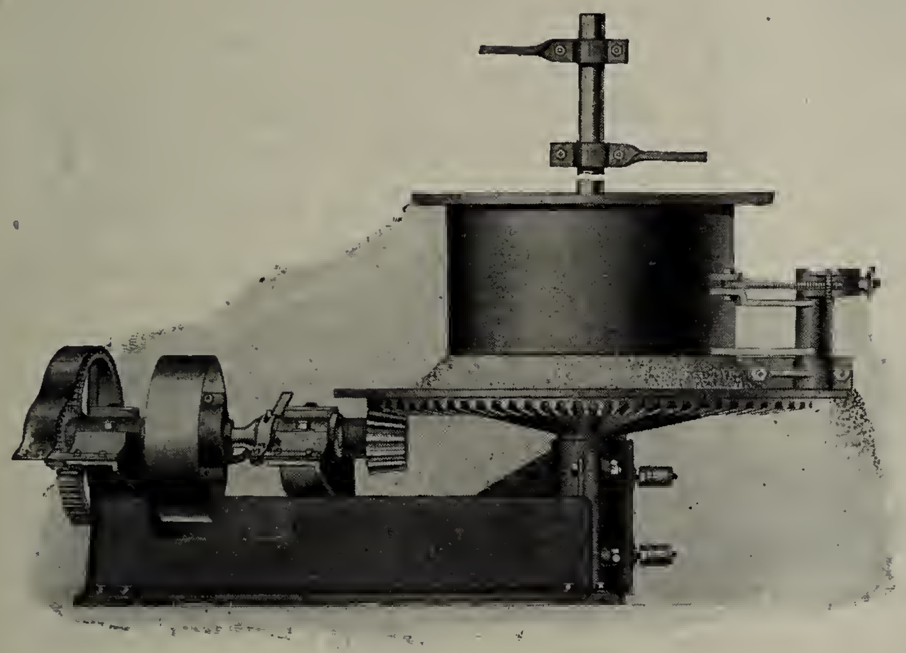
name ....

....

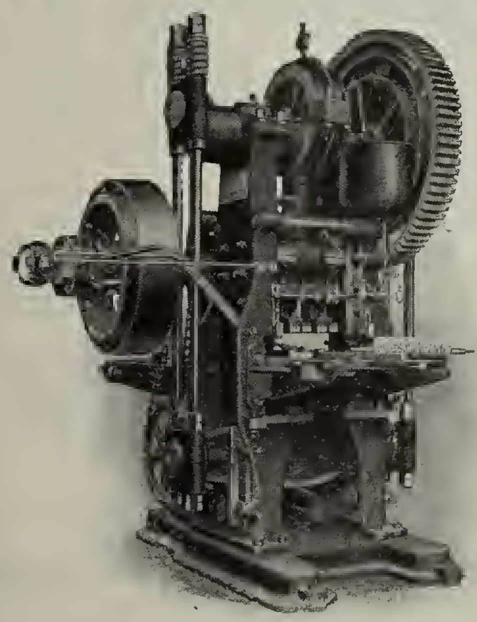
(Cross out the items not wanted, fill in and mail us the coupon.)



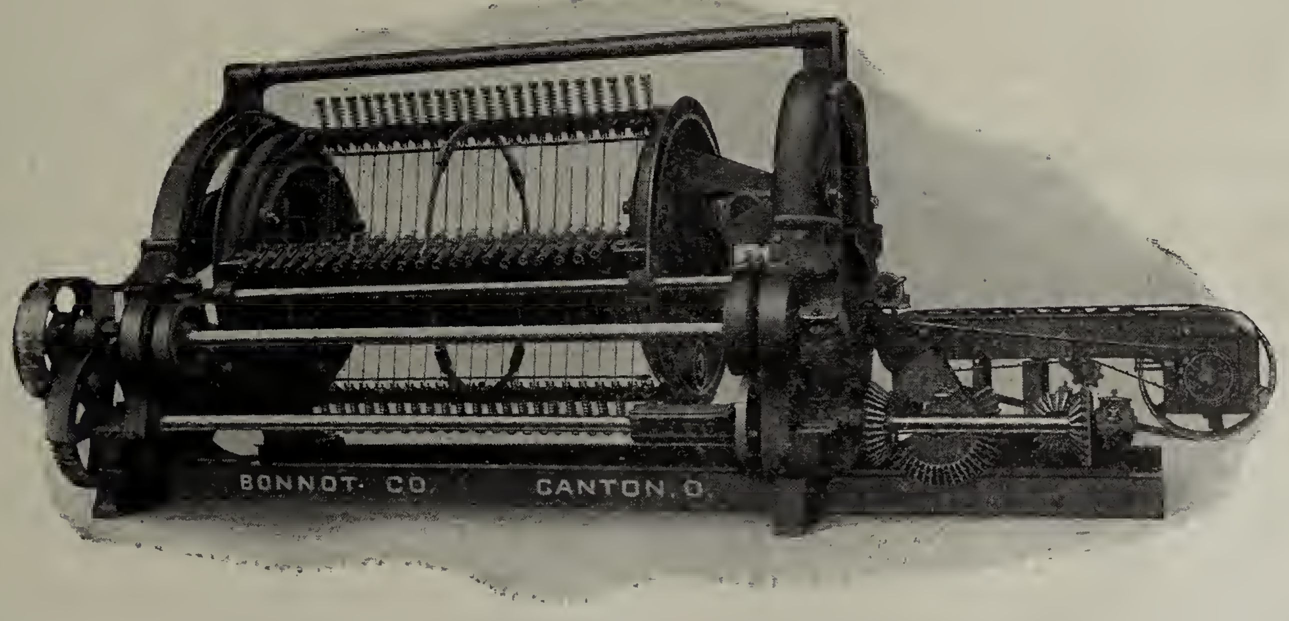
NO. 17 HOLLOW-WARE MACHINE, capacity 100-125 tons per day.



CLAY FEEDER



BONNOT REPRESS



ROTARY AUTOMATIC CUTTING TABLE

THE BONNOT COMPANY

CANTON, OHIO

909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

See our advertisement on page 251.

"WHOSE MACHINERY SHALL WE BUY?"

DO YOU KNOW WHERE BRICK MACHINERY IS MADE?

THEN NOTE THE SIGNIFICANCE

In and About
Wellsville, Ohio,
STEVENSON'S HOME
are
25 CLAY PLANTS
and **all**
STEVENSON'S
MACHINERY.

In PENNSYLVANIA
the
STEVENSON PLANTS
are about **2 to 1**
of any other make.

In TORONTO, O.,
Territory
90 Per Cent of the
plants are
STEVENSONS.

In AKRON, O., Territory
are the two great concerns
THE ROBINSON CLAY PRODUCT CO.
and
THE AMERICAN SEWER PIPE CO.
also
THE BUCKEYE SEWER PIPE CO.
THE GRANITE CLAY CO.
THE EVANS CLAY MFG. CO.
THE MAURICE A. KNIGHT CO.
THE MURRAY BRICK CO.
THE JOHN KLINE CO.
and then some, and
ALL STEVENSONS.

Write for Stevenson's
Catalogue, just out,
illustrating and describing
their great new
10=Foot Dry Pan
and 9-foot Duplex
Wet Pan
and many other
labor-saving devices.

WHAT'S THE ANSWER?

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Bricklaying System, by Frank B. Gilbreth. Price $3.00.

A book whose 330 pages are filled with rules and hints for the foreman and bricklayers, designed to increase the output of the workmen and enable them to do difficult work in the best manner.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

Drying Brick, by W. D. Richardson. Price 25 Cents.

A little booklet giving and explaining the various styles of dryers, etc.

T. A. RANDALL & CO.
Indianapolis, Ind., U. S. A.

The Dunn Wire=Cut=Lug Brick Co.

Leaders in Progress:

1.—In revolutionizing the Paving Brick Industry by putting Lugs on wire-cut Paving Brick without Repressing—1909.

2.—In standardizing the Size of Paving Brick—1912.

3.—In reducing the Depth of Sand Cushions—1914.

4.—In eliminating Sand Cushions and Substituting Cement-Sand Beds—1915.

5.—In inaugurating the Green Concrete, or Rigid, type of Construction of Brick Pavements—1915.

6.—In improving the construction of Brick Pavements laid on natural soil in the South, specifying edge-laid brick with cement-grout filler; omitting flush edgings or curbs—1915.

7.—In establishing a free advisory engineering service for the benefit of communities, municipalities, counties and states using Wire-Cut-Lug Brick.

8.—In establishing a free ceramic engineering department to aid licensees in perfecting their product.

9.—In affording local engineers the benefit of free expert highway engineering advice in preparing specifications. The Dunn company also furnishes materials and educational literature to highway engineering schools in colleges, universities and Institutes of Technology.

10.—In granting no license to a company which is not of good business repute or which cannot prove its ability to make first-class brick.

11.—In stipulating in its license contract that the license may be cancelled if the licensee at any time fails to make brick satisfactory to the licensor.

12.—In putting Brick Pavements where they rightfully belong—at the head of the procession.

LOOK AT THESE FIGURES:

2,233,000 Wire-Cut-Lug brick sold in 1910.
7,572,250 Wire-Cut-Lug brick sold in 1911.
25,023,904 Wire-Cut-Lug brick sold in 1912.
36,912,320 Wire-Cut-Lug brick sold in 1913.
104,827,420 Wire-Cut-Lug brick sold in 1914.
138,276,174 Wire-Cut-Lug brick sold in 1915.

Wire-Cut-Lug brick are made by 28 of the most reputable paving brick manufacturers of the United States, operating 45 plants.

Advisory Engineering Service Free—For using Wire-Cut-Lug Brick services of Ceramic Engineer free to licensees.

Write for data.

Licensed Manufacturers.

Corry Brick & Tile Co., Corry, Pa.
United Brick Co., Greensburg, Pa.
  Plant at Conneaut, Ohio.
Sterling Brick Co., Olean, N. Y.
Reynoldsville Brick & Tile Co., Reynoldsville, Pa.
Danville Brick Co., Danville, Ill.
Clinton Paving Brick Co., Clinton, Ind.
Alton Brick Co., Alton, Ill.
Medal Paving Brick Co., Cleveland, O.
  Plants at Cleveland, Carrollton and Malvern, Ohio.
Tuna Valley Pressed Brick Co., Bradford, Pa.
Metropolitan Paving Brick Co., Canton, Ohio.
  Four Plants at Canton, O., and One at Willow, O.
Bessemer Limestone Co., Youngstown, O.
  Three Plants at Bessemer, Pa.
Peebles Paving Brick Co., Portsmouth, O.
  Two Plants at Portsmouth, O., and One at Firebrick, Ky.
Murphysboro Paving Brick Co., Murphysboro, Ill.
Southern Clay Manufacturing Co., Chattanooga, Tenn.
  Plants at Robbins, Tenn., and Coaldale, Ala.
McAvoy Vitrified Brick Co., Philadelphia, Pa.
  Plant at Perkiomen Junction, Pa.
Windsor Brick Co., Akron, Ohio.
Hocking Valley Brick Co., Columbus, O.
  Plant at Logan, Ohio.
Veedersburg Paver Co., Veedersburg, Ind.
Springfield Paving Brick Co., Springfield, Ill.
Terre Haute Vitrified Brick Co., Terre Haute, Ind.
Albion Vitrified Brick Co., Albion, Ill.
Alliance Clay Product Co., Alliance, O.
Westport Paving Brick Co., Baltimore, Md.
Mack Manufacturing Co., New Cumberland, W. Va.
  Four Plants at New Cumberland, W. Va.
Hydraulic-Press Brick Co., St. Louis, Mo.
Barr Clay Co., Streator, Ill.
Burton-Townsend Co., Zanesville, Ohio.

The Dunn Wire=Cut=Lug Brick Company

(Licensors)

Conneaut, Ohio

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LET MENTZ MOULD YOUR FUTURE

LET MENTZ MOULD YOUR FUTURE

MENTZ MOULDS WILL MOULD YOUR FUTURE SO YOU WILL SAVE MONEY, MAKE A BETTER PRODUCT AND LARGER PROFITS.

MR. George B. Mentz has made a lifetime study of the manufacture and use of brick moulds on his plant near the Hudson River. His close contact with the manufacturers of soft mud brick and the brick business in the East affords him every opportunity of knowing what is required and what is absolutely right. His moulds meet every requirement, and today are far superior to any other moulds made in this country.

The general use of Mentz Moulds in the great Hudson River and New Jersey brickmaking districts and throughout the East and in Canada, shows their real value. These moulds are also found in the leading soft mud plants in the Middle West. It is a fact that can be proven that no brickmaker who has given the Mentz Moulds a fair trial would do without them.

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The G. B. MENTZ CO.
WALLKILL, N. Y.

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This is not a campaign to sell any one material, nor is it an effort to "knock" any type of construction.

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This organization is known as THE SAFE and it is making converts every day, and in the territories where it is active the building records show a marked increase of the use of fire-safe materials.

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Society Advocating Fire Elimination

R P. Stoddard, Secretary

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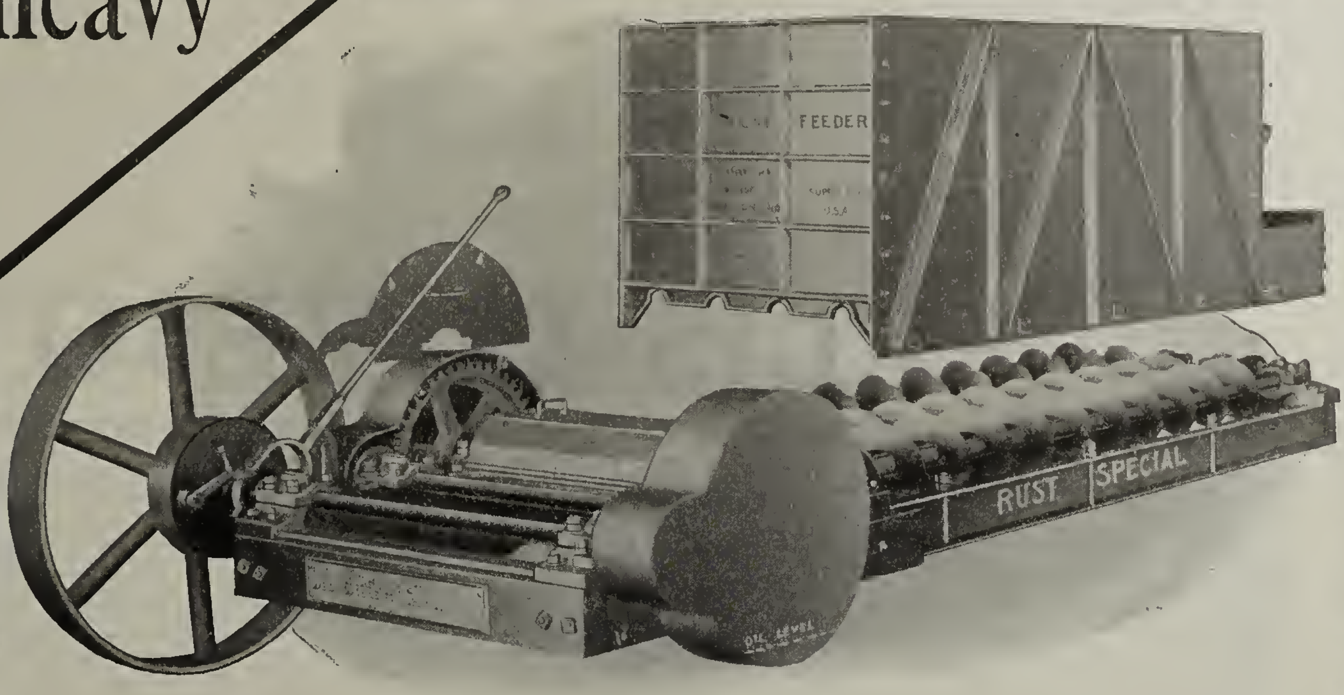

Will help you to get full capacity out of your dry pan, pug mill auger---insure a regular delivery to your off-bearers, speeding them up so you will get greatest efficiency from them---and also cuts out the labor of two men. It tempers the clay perfectly---improves the product---speeds up the plant.

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We know the "RUST SPECIAL" Clay Feeder will do all we claim for it—that's why we sell it under an absolute guarantee. Ask for our Special Bulletin on this.

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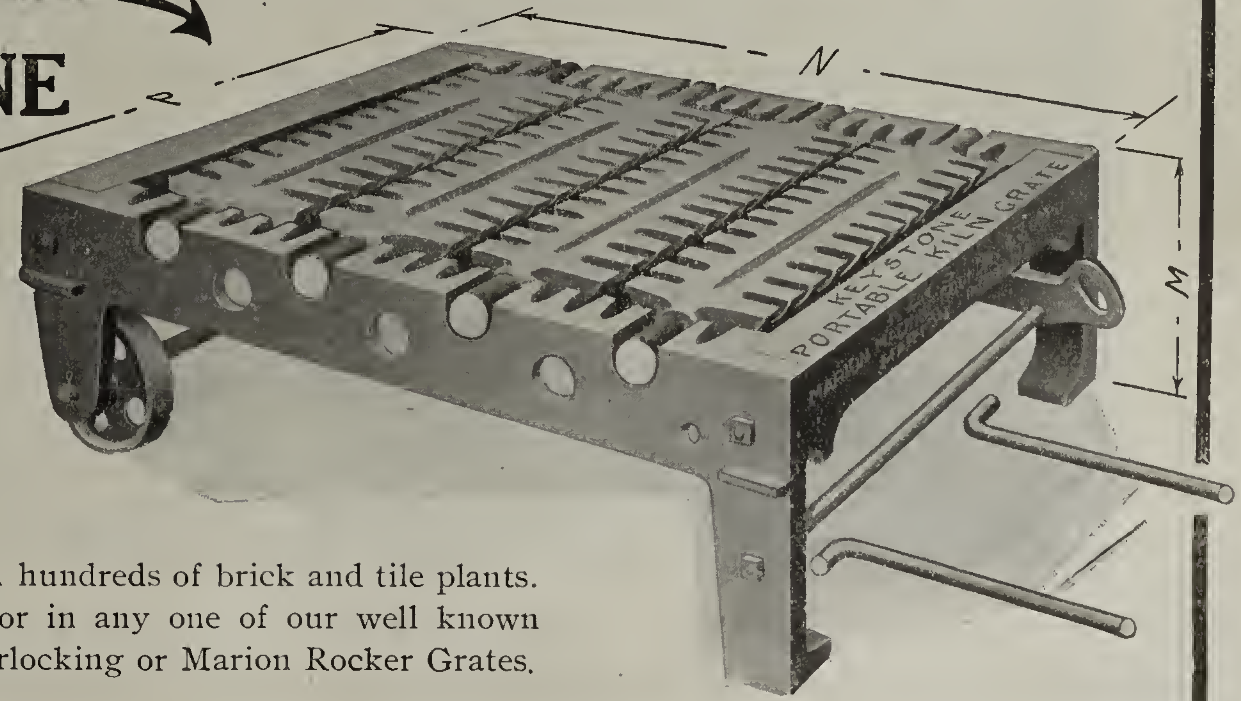

The Ideal grate for kiln use—made durable throughout—offers flat surface for fuel—no intricate parts—easy to repair or replace sections.

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WHAT ONE OF OUR MANY SATISFIED CUSTOMERS HAS TO SAY.

Wellington Machine Co.,
Wellington, Ohio.

Have found your Dryer a grand success. We are having no trouble and are actually drying brick in this Dryer that does not cost us a cent. The Wellington Dryer is one of the best on the market.

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A. R. Kuhlman, Mgr., Toledo, Ohio.
June 29, 1915.

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American Bldg. Brick Co., Cleveland	30,000 capacity
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Farr Brick Co., Cleveland, H plant	120,000 capacity
Standard Brick Co., Cleveland	120,000 capacity
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Ithaca Brick & Tile Co., Ithaca, N. Y.	30,000 capacity
Mercier-Bryan-Larkins Brick Co., Detroit	60,000 capacity
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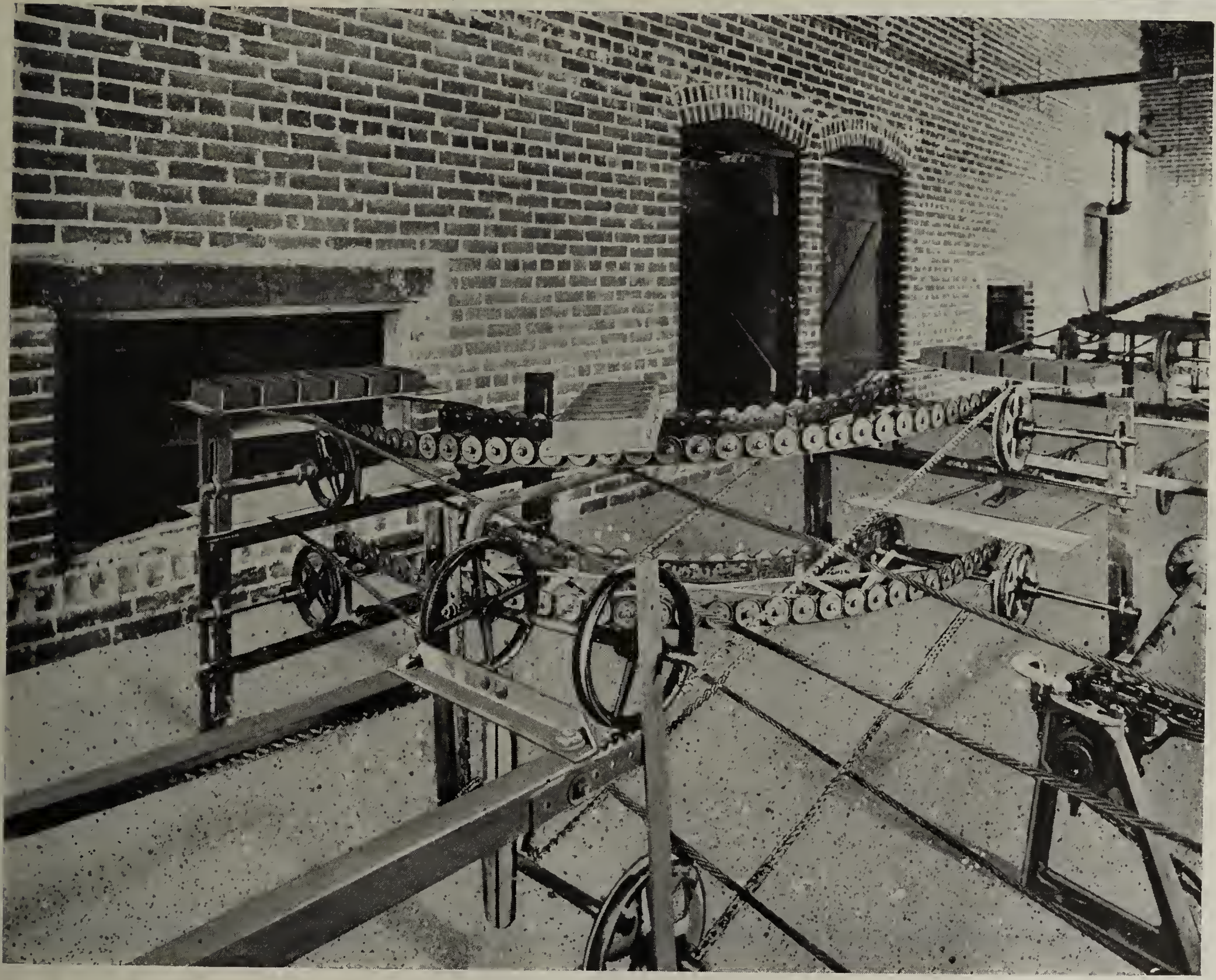
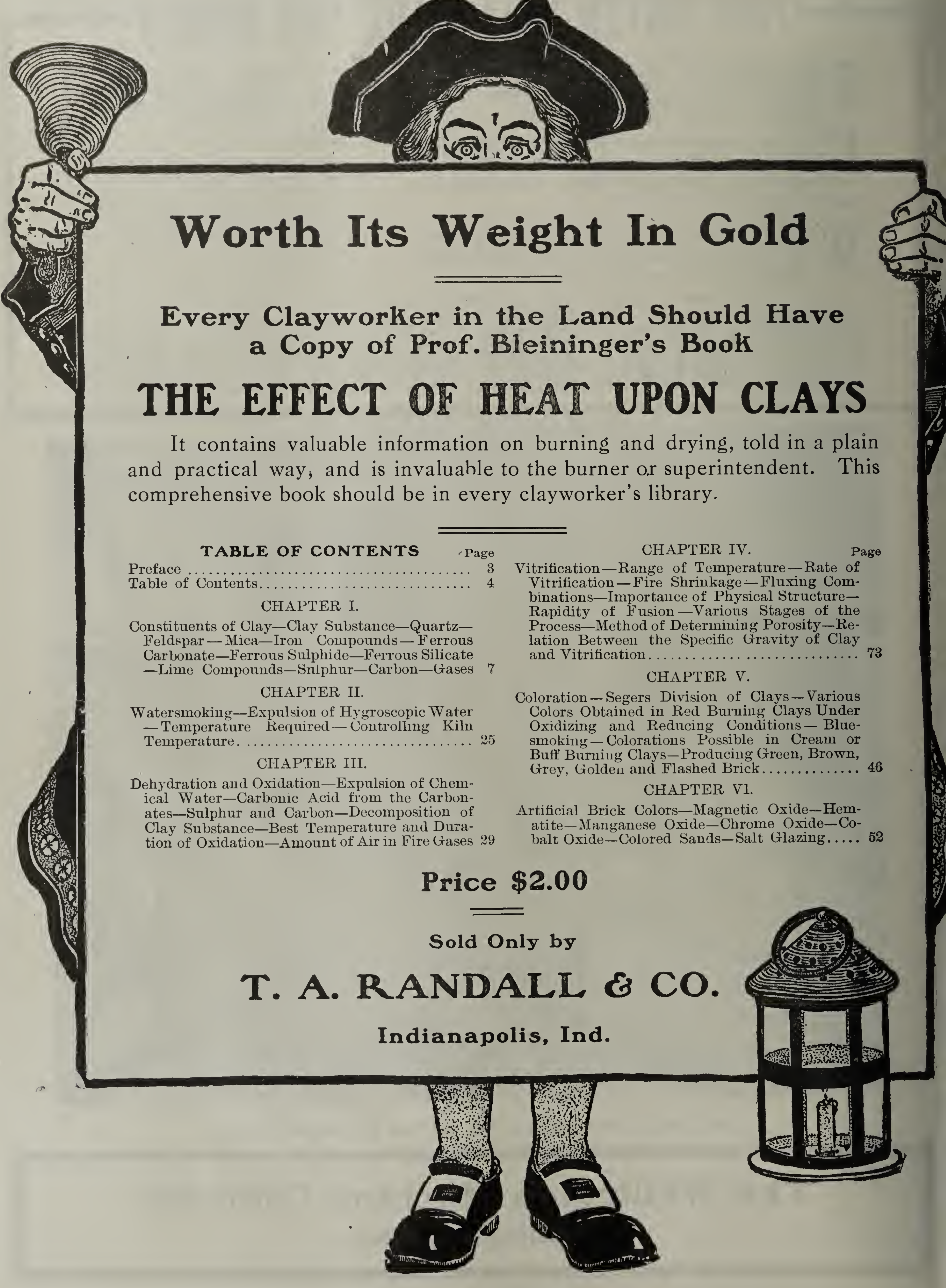


Cross Conveyor With Gravity Curves, and Brick Entering Dryer Tunnel.

The Wellington Machine Company
Wellington, Ohio



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THE EFFECT OF HEAT UPON CLAYS

It contains valuable information on burning and drying, told in a plain and practical way, and is invaluable to the burner or superintendent. This comprehensive book should be in every clayworker's library.

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The "New Haven" Horizontal Brick Machine is the Strongest Soft Clay Brick Machine in the World.

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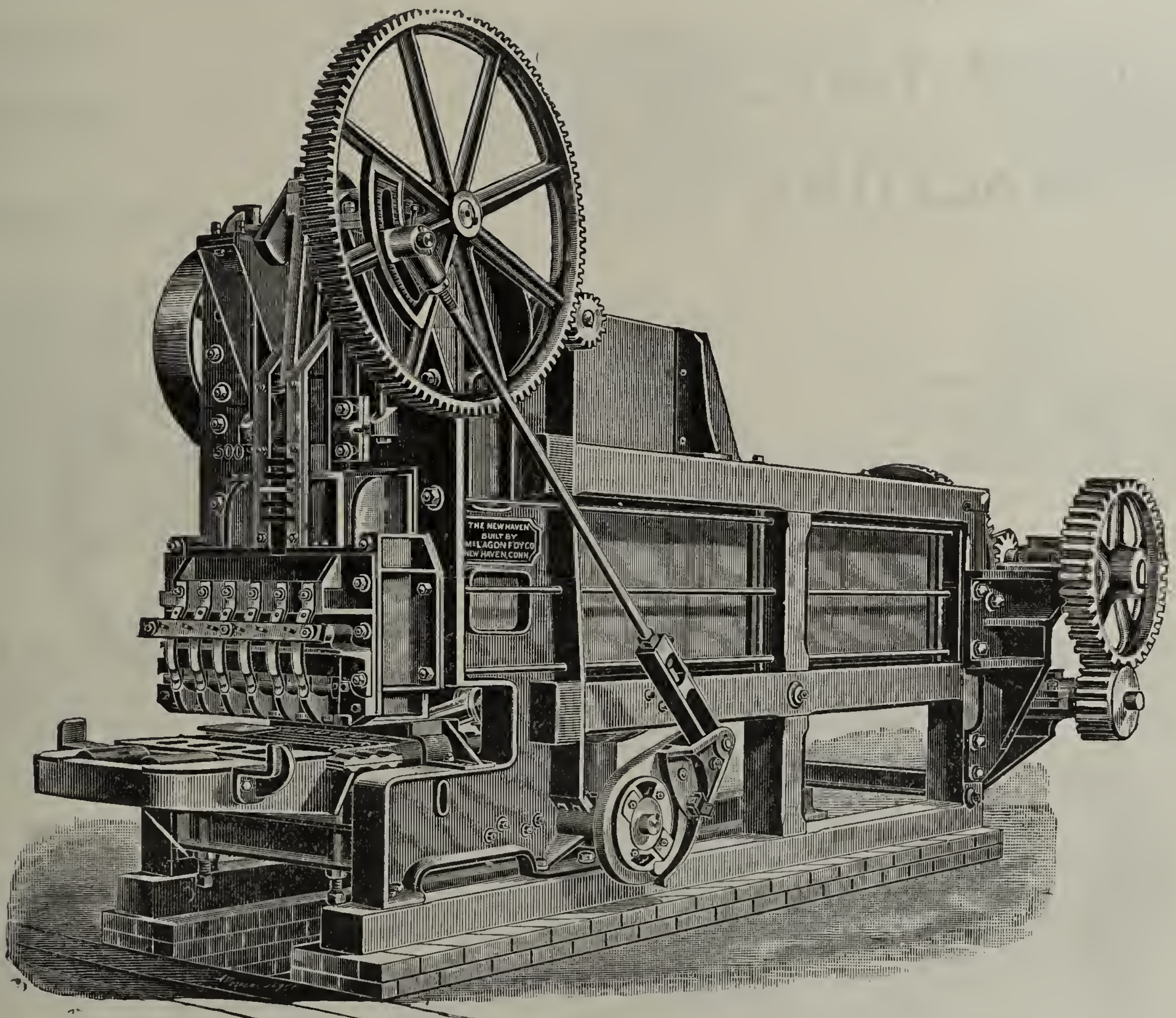
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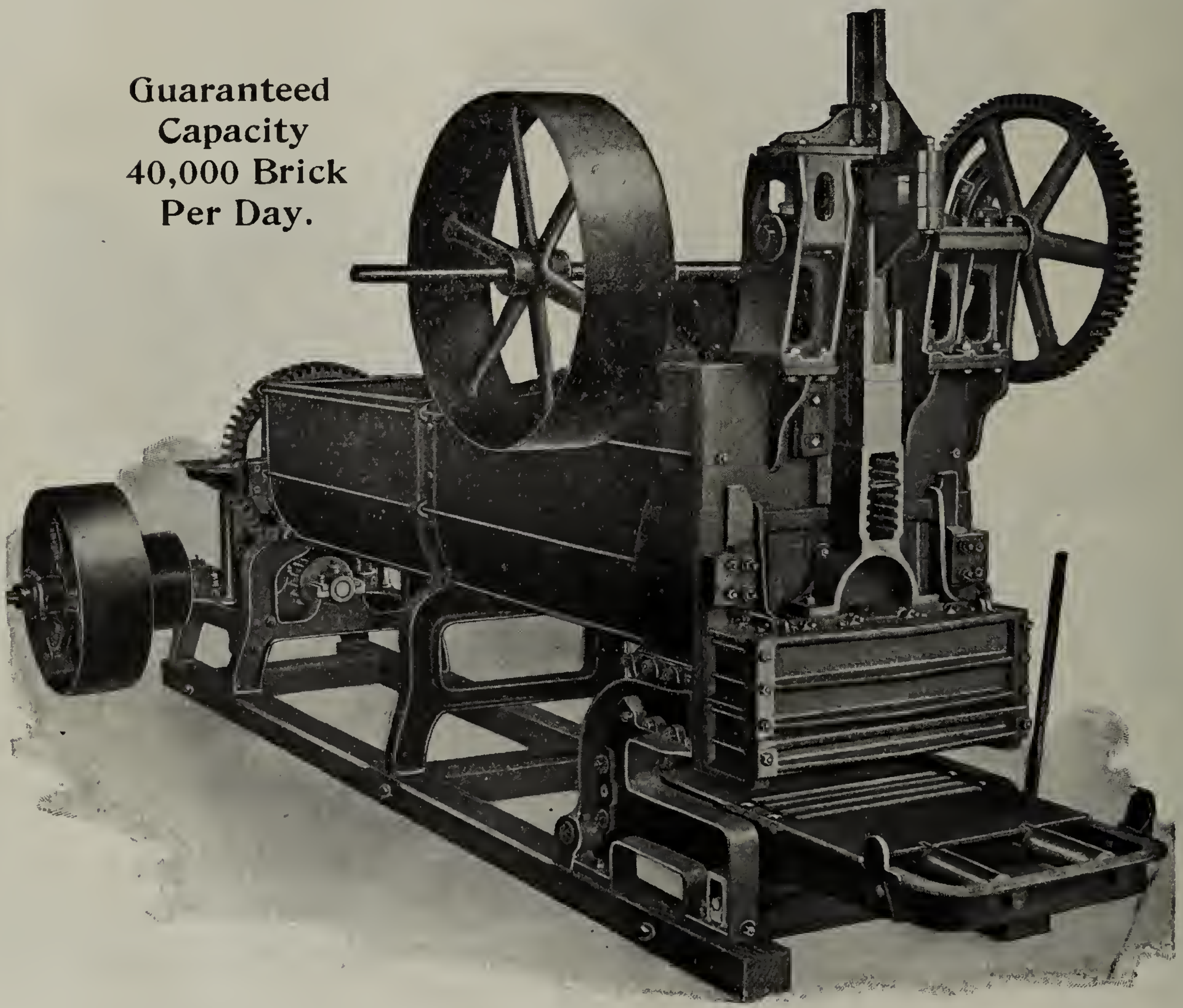

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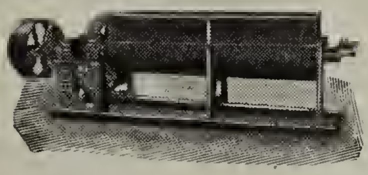
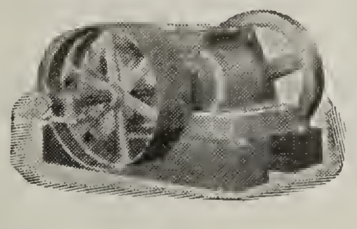
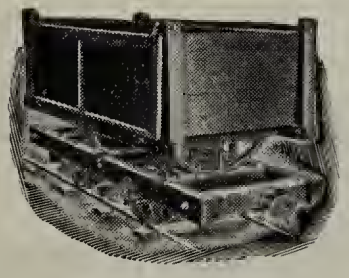
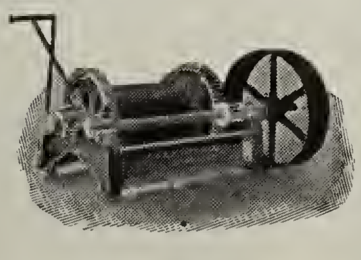
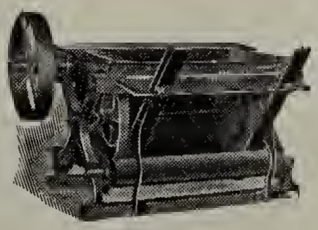
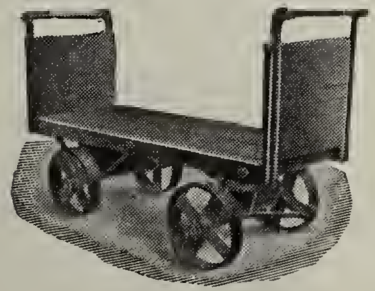

Double Geared Pug Mill

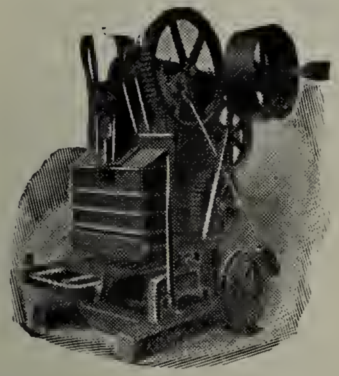

Style "P" Roller-Crusher

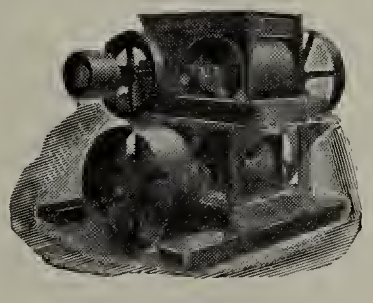

Side Dump Car


Style "B" Winding Drum


Style "A" Mould Sander


Mule Truck


Vertical Brick Machine


Style "P" Compound
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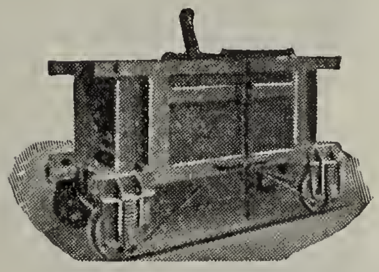
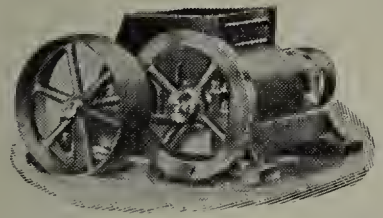

Bottom Dump Car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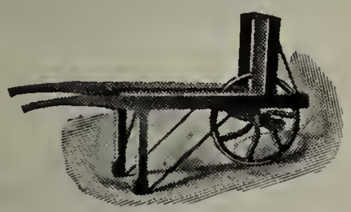
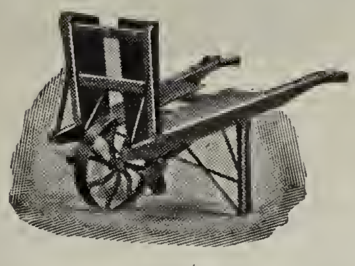
For any size fire box
on boiler or kilns


No. 6 Barrow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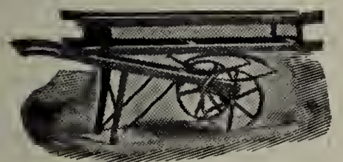
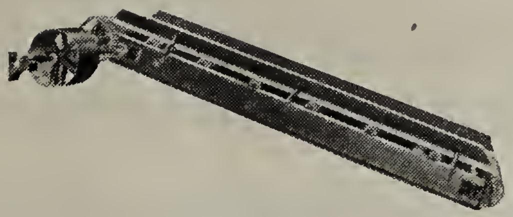
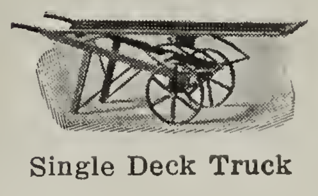

Double Deck Truck


Clay Elevator.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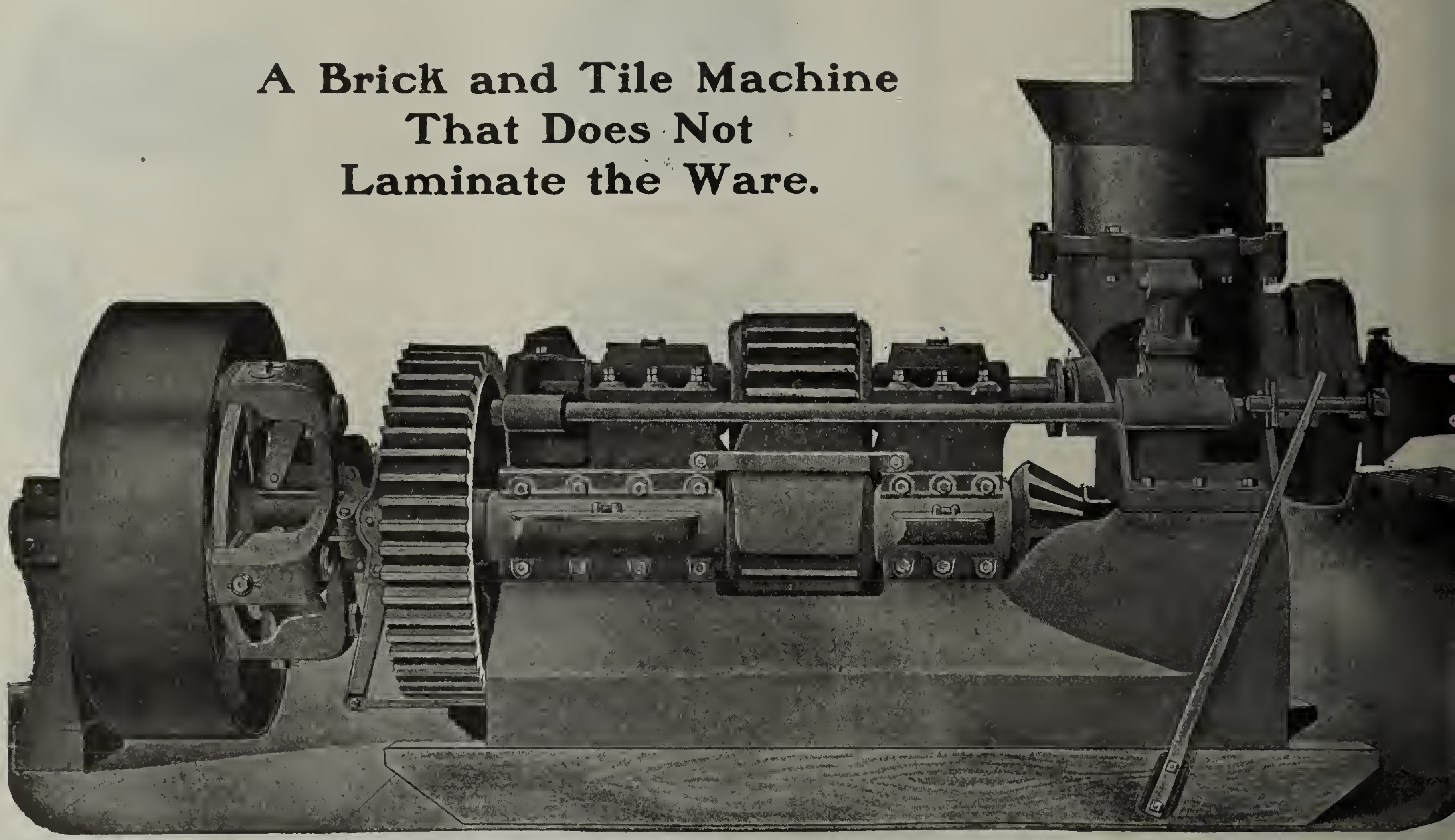

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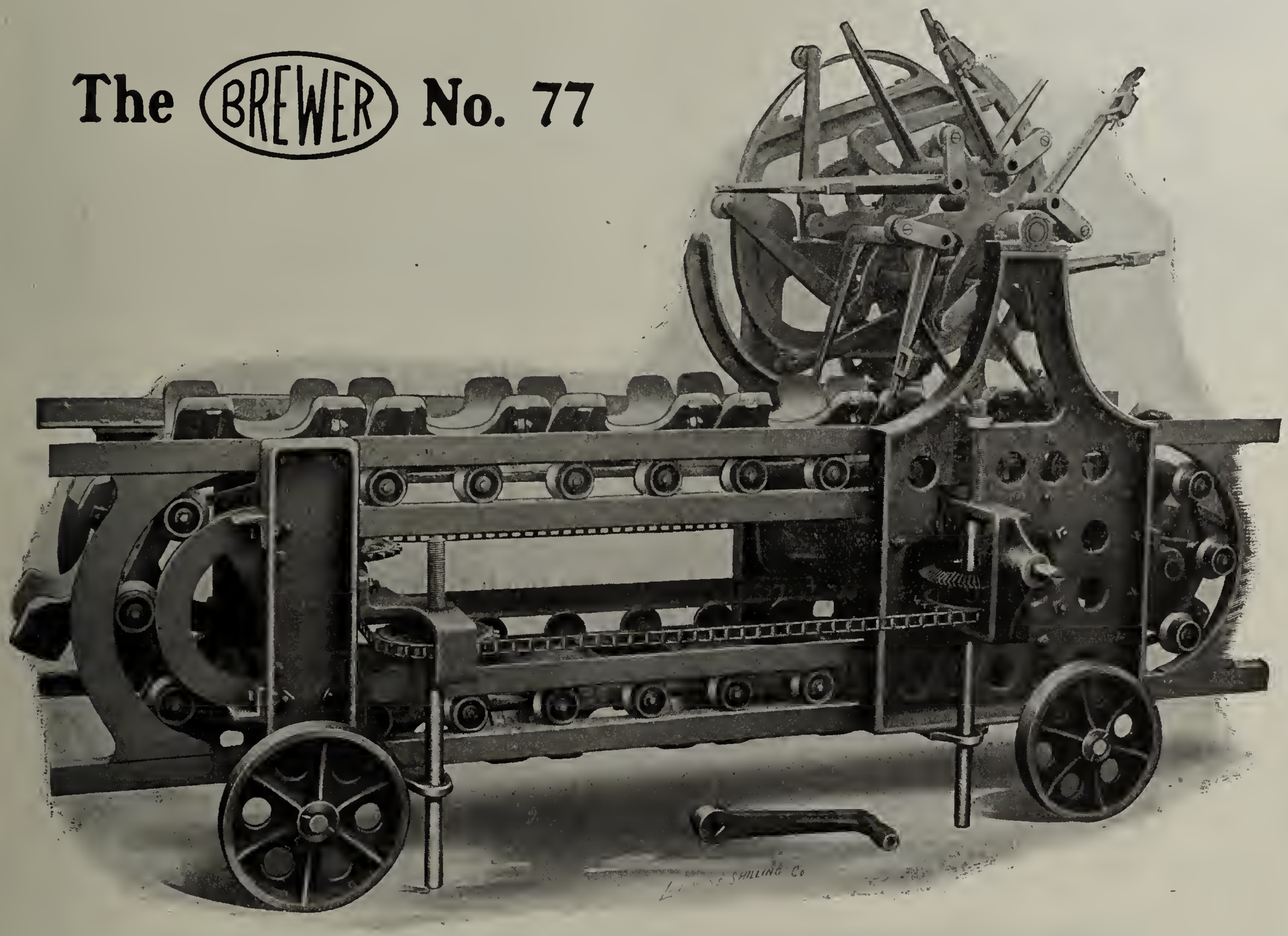
Automatic Drain Tile Cutters

The BREWER No. 77



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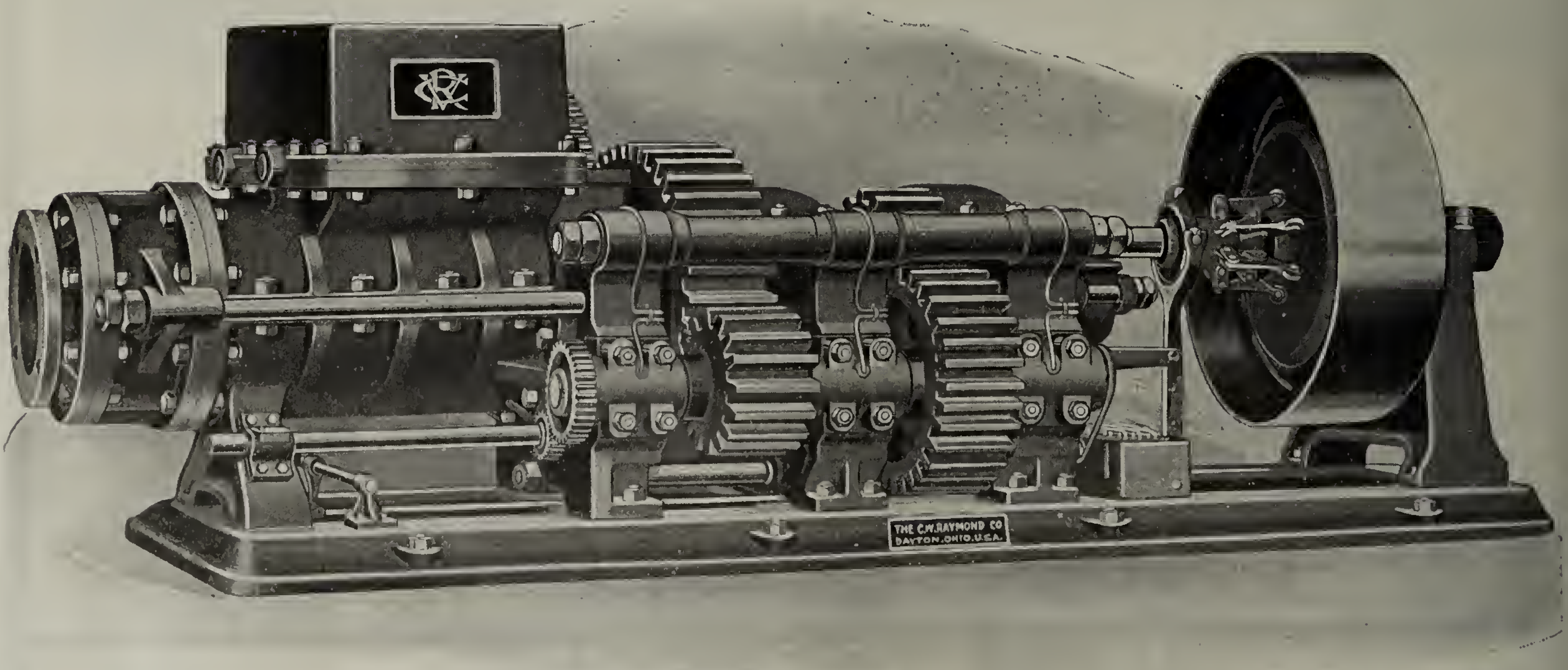
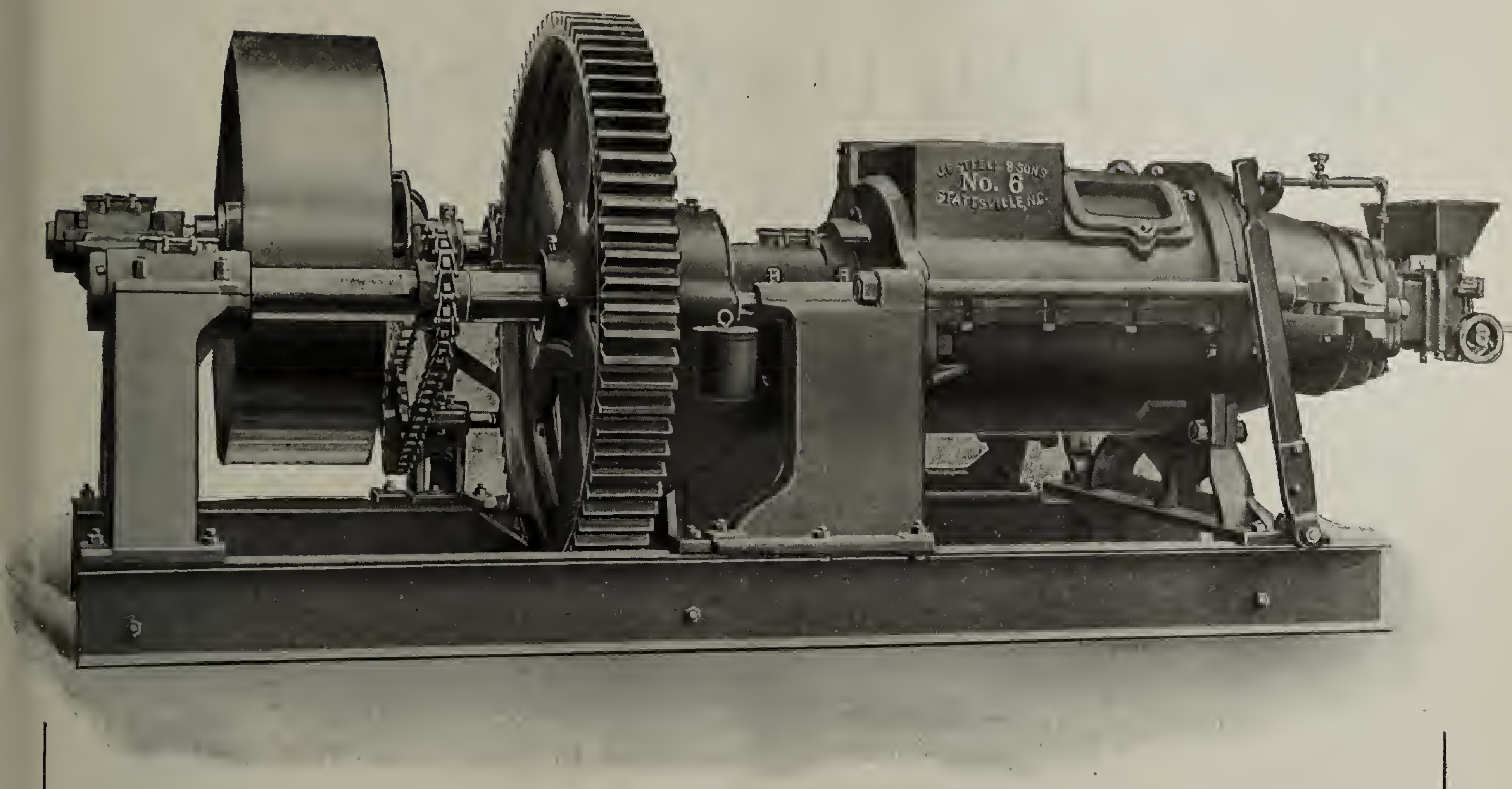


The "C V R" Holloware Machine.



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A brick machine of largest capacity with single gear driving mechanism of new and improved design.

Tested for hours at a speed of 45 revolutions per minute of the auger shaft. Remember, engine speed and auger shaft speed are fixed speeds, and the less transmitting appliances between them, the less power required.

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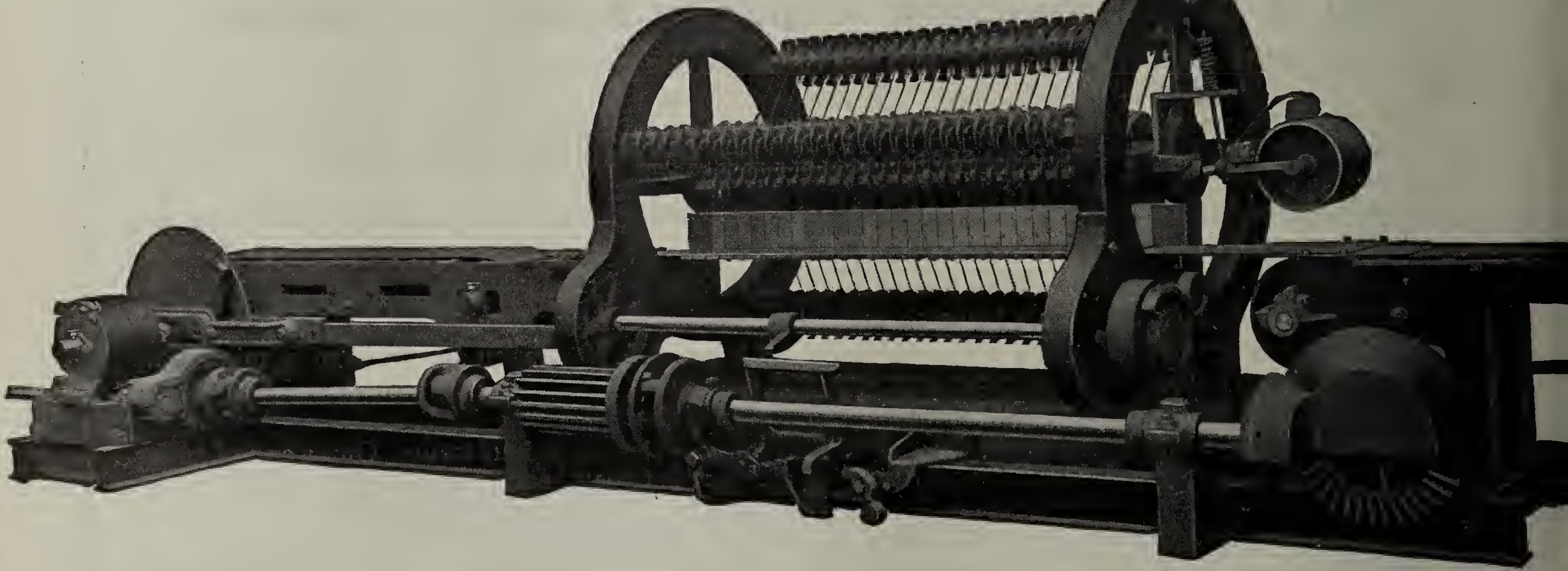
When you know it is operating successfully on several hundred plants, under many different working conditions—

When you see it producing the highest grade un-repressed face brick as well as pavers and common builders—

And when you find it on the plants of the most successful brickmakers everywhere—

You know it is a **proven** cutter.

You may guess what a new partially-tested automatic cutter **might** do—there is no need to guess what the Freese cutter **is** doing and what it **will** do on your plant.



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A downward-shearing, quality-producing wire movement, with positive never-miss operating mechanism—An understandable, sure-acting automatic cutter from which you can expect immediate satisfactory operation.

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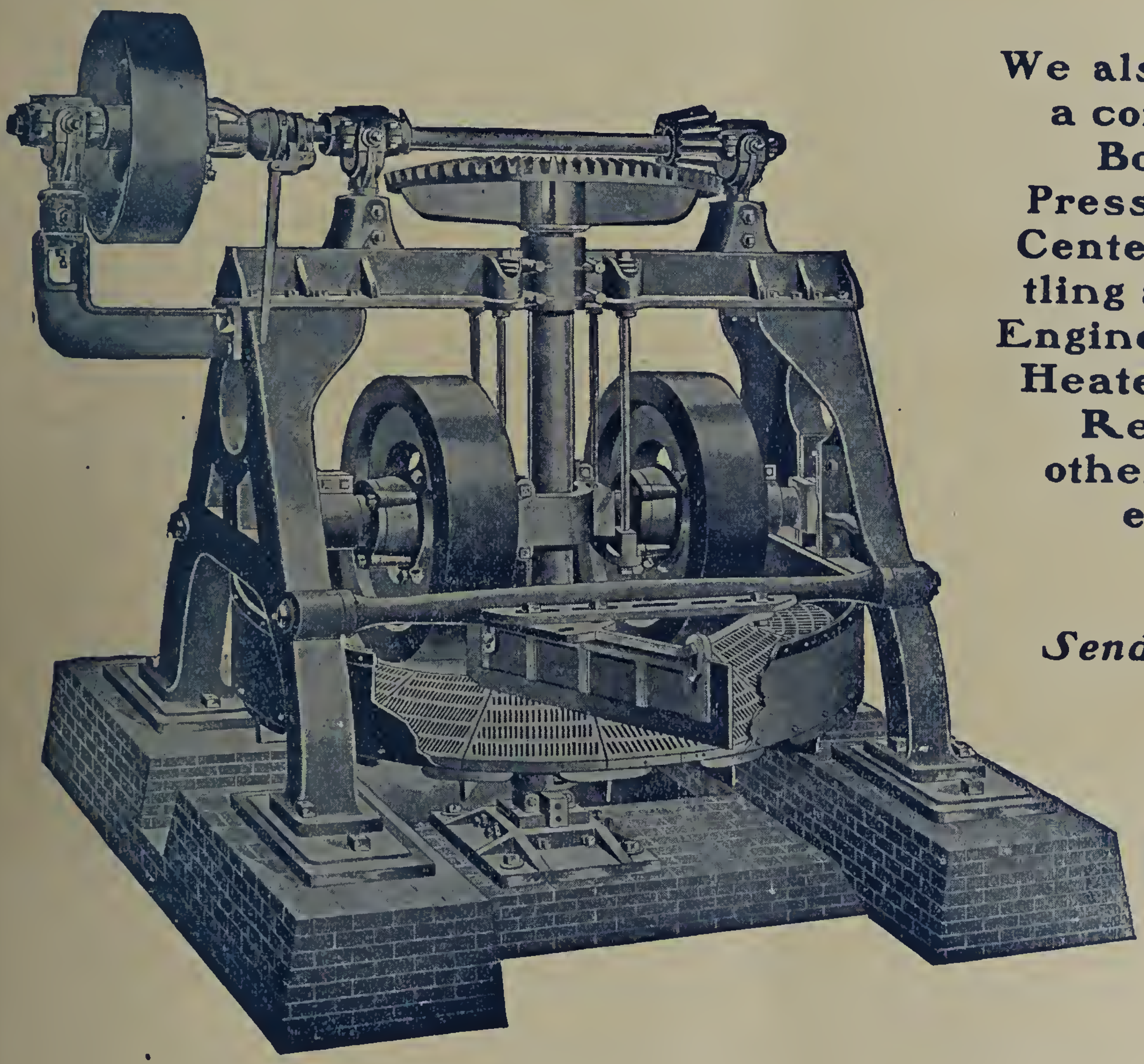

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Center Crank Throttling and Automatic
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This is not an over-enthused statement by the manufacturer—it is based on actual tests under practical condittions for the past three years by scores of clayworkers who have bought and used these "Little Giants of Power."

And furthermore, this statement is backed up by definite ones from each of these clayworkers who go into details as to comparative cost data.

Don't Miss This Opportunity to Learn Some Vital Cost Facts About Clay Hauling

We have published a little pamphlet that not only gives these statements over the signatures of "Plymouth" owners, but shows pictures of installations and gives you all the information you want to know.

Better let us mail you a copy today and start you on your way to closing up one of the biggest leaks about your plant—clay haulage.

Use Coupon For your convenience there is a coupon at the left all ready to sign and mail, but a postcard will do, if you prefer. Should you write, ask for "Cutting Haulage Costs in Clay Plants," as we issue booklets for all sorts of haulage problems.

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

(Firm Name).................

(City) ....

(Street) ....

(State) ....

THE J. D. FATE COMPANY 242 RIGGS AVE., PLYMOUTH, O.

The Cleveland Conventions Were Profitable to Those Who Went for Profit

The Wise Man of FATE

When one **wants** to profit by coming in contact with ellow co-laborers he usually succeeds.

Conventions, therefore, can be made profitable or unrofitable, just as one determines.

The same is true in all business effort and initiative, nd especially true with clayworkers who **want** to profit y the successes of other clayworkers.

Many of the most successful clayworkers attribute their uccess to

The FATE
Premier Line
of Clayworking Machines and Devices

Look over the list of some of the largest plants in the United States and Canada and you will find 'ate Premier machinery converting raw clay into finished product at the minimum of cost and the aximum of production and perfection.

This line of clayworking machinery has been standard for nearly half a century and its long record f achievement, even under the most severe tests, proves that there is SOMETHING about it worth inestigating.

Why Not Profit Yourself by the Experience of Other Clayworkers?

The other man's success always is worth investigating. If you care to know WHY and IOW some of these large (and small plants, too) make a success out of their business, ve will lay the facts before you.

"Fate's Free Service Men" is an organization of practical men which is at your disosal on any problem that confronts you. Put any question up to them and the inormation is yours without price.

Jse Coupon For your convenience there is a coupon at the right. Check off in the little squares the item you are most interested in, or if you refer, write us a personal letter with any details you deem necessary to give us thorough understanding.

THE J. D. FATE CO., 242 RIGGS AVE., PLYMOUTH, O.

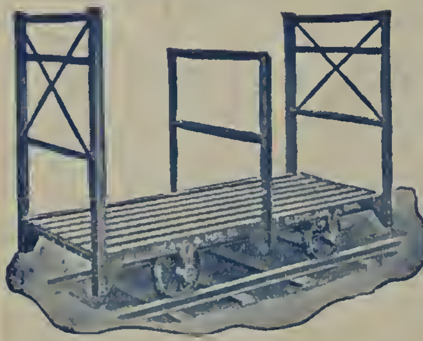
The J. D. Fate Co., 242 Riggs Avenue, Plymouth, Ohio.

We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner

☐ Auger Brick Machinery
☐ Hollow Ware Machinery
☐ Disintegrators
☐ Conveyors
☐ Drain Tile Machinery
☐ Full Equipment
☐ Industrial Locomotives
☐ Clay Feeders
☐ Pug Mills
☐ Crushers
☐ Elevators
☐ Clay Testing

Name ....

Town.................................. State...............

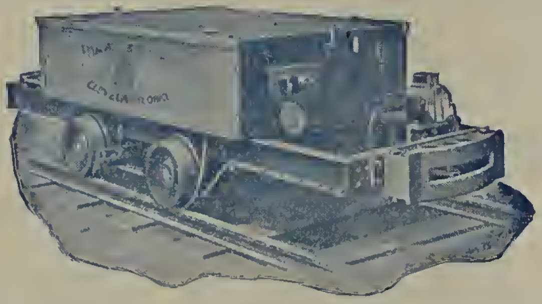


No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives



Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

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BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information

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Machine & Mfg. Co.
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With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

LAKEWOOD NO. 166

Dryer Cars
Rack Cars
Dump Cars

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

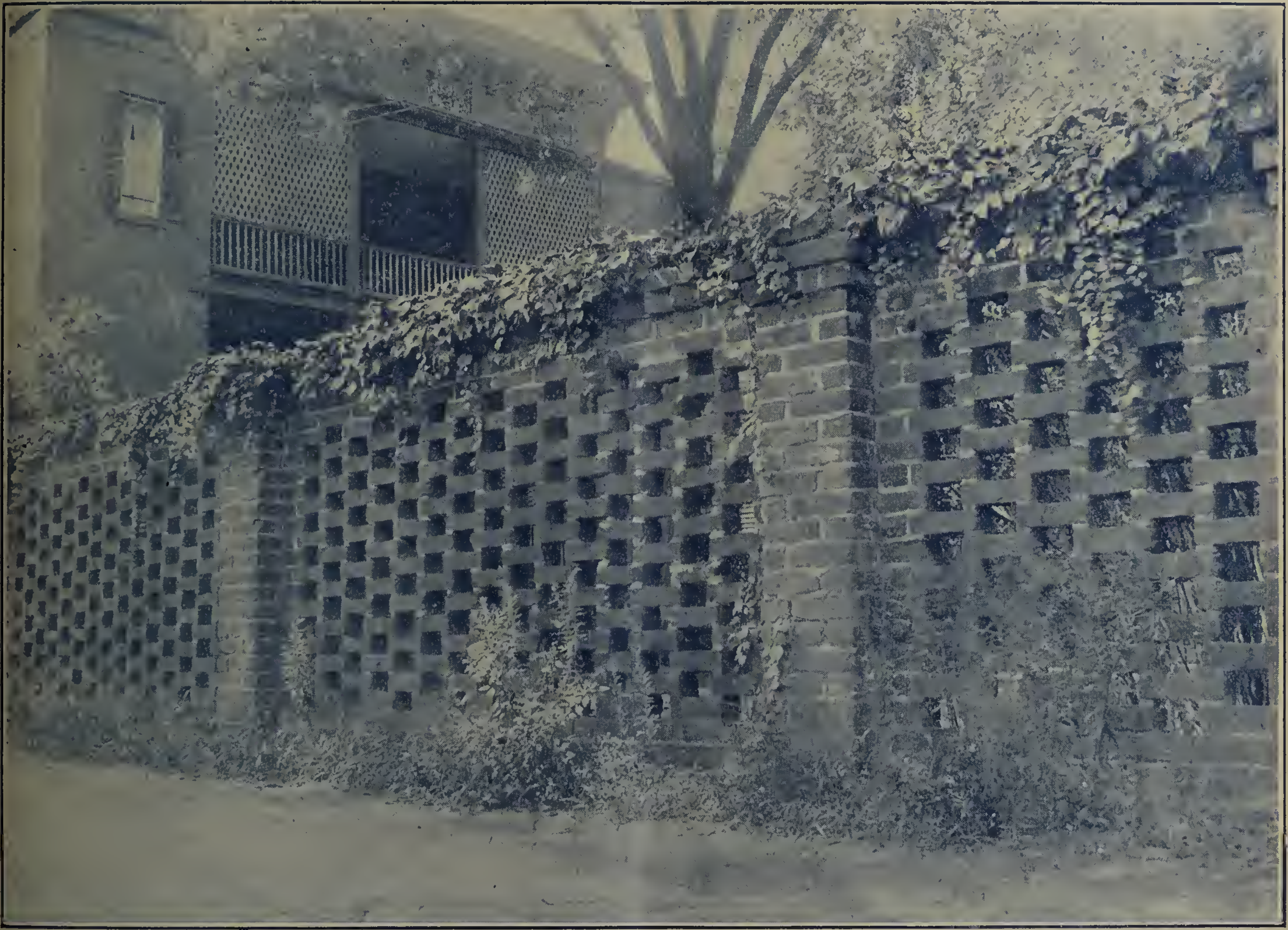
The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

Chicago: 506 S. Canal St. Pittsburgh: 1230 Fulton Bldg.
New York: 30 Church St., Room 802.
Baltimore: Munsey Bldg. Kansas City: N. Y. Life Bldg.

UNIVERSITY OF ILLINOIS

APRIL, 1916

THE CLAY-WORKER



An Unusual Piece of Brick Work. A Brick Garden Wall at Wilmington, N. C.
See page 430.

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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BUYERS' READY REFERENCE LIST
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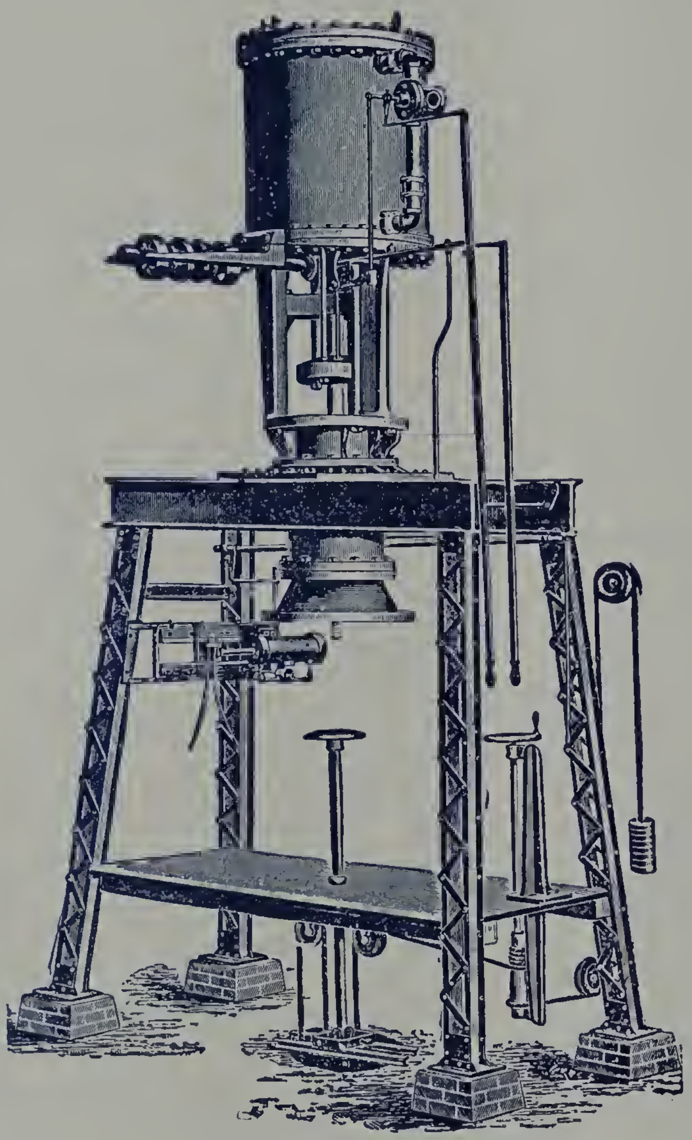
All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.

ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC.



Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.

We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

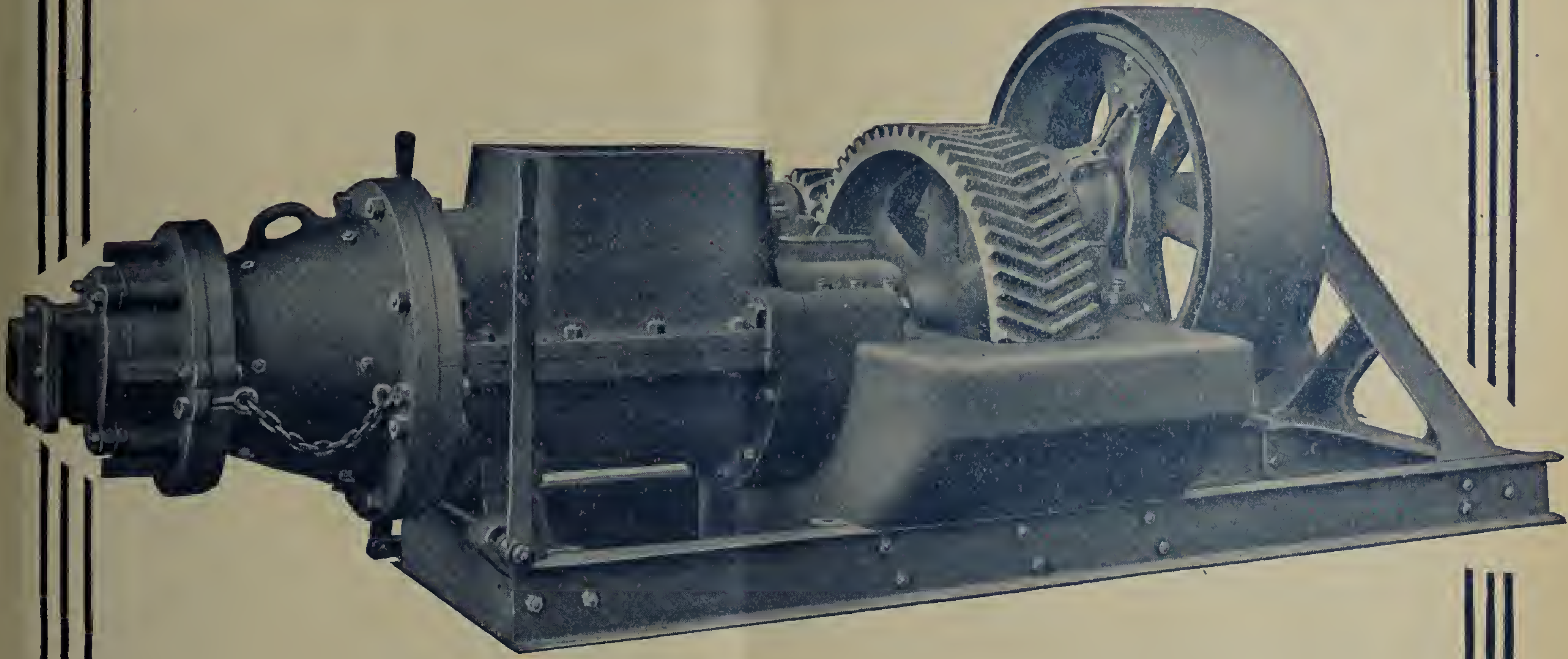
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



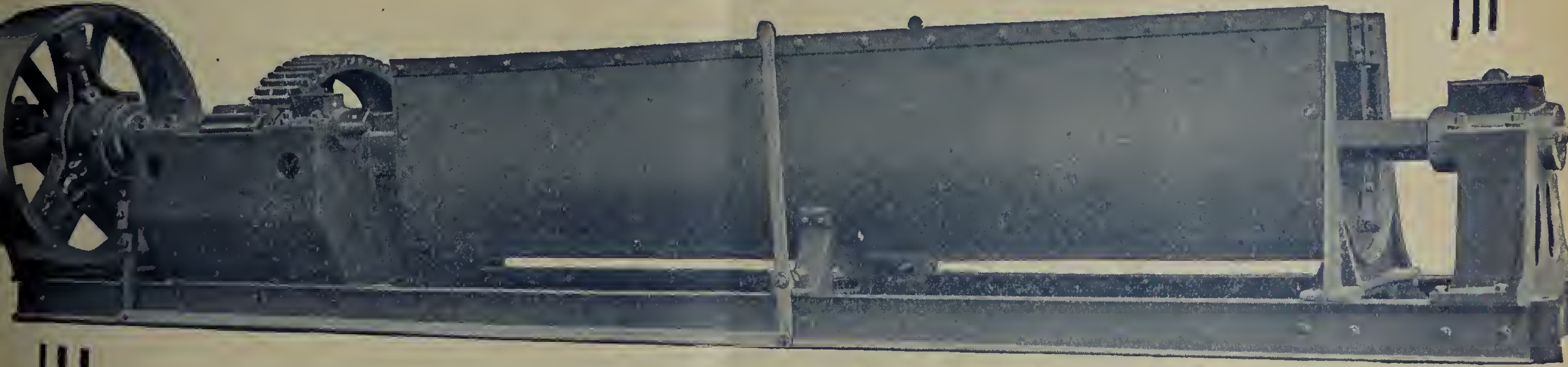
THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.



THE BONNOT COMPANY

CANTON, OHIO

909 N. Y. Life Bldg.
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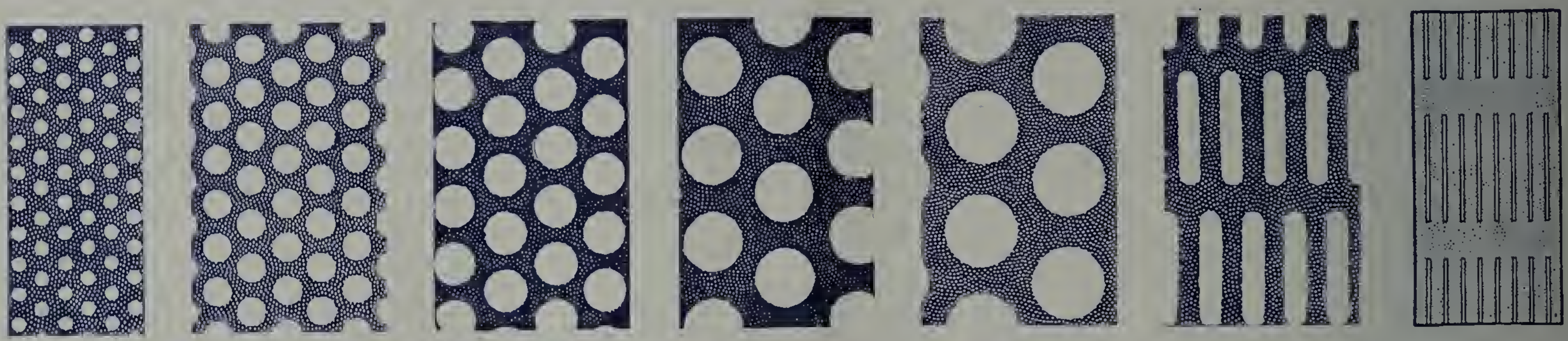
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

"No Wheelers Wanted" at this Plant for Loading Cars.

The rush season has no terrors for the Cuyahoga Brick & Shale Co. (Cleveland, Ohio.) The photograph at the left shows how they have beaten the "wheeling" game with a system of Mathews Gravity Brick Conveyers. A steady stream of brick flows steadily from kilns into cars in any kind of weather and with any kind of help.

This method enables you to roll your brick by gravity on a slight down grade, with no waste of time or labor to pay for, no damaged brick to discard, no expensive pay roll to take care of, and no fear of not being able to get your brick loaded promptly at all times.

Many large brick manufacturers have become users of the Mathews system this year. Hundreds of others have employed the gravity method for many years and could not be induced to discard it for any other method. We can supply prospective purchasers with plenty of references if desired.

Made entirely of steel, equipped with ball bearing rollers, assembled in portable units fitted with universal couplings. Curves of any desired angle can be supplied to deliver the brick to any required destination. Will last for years with very little upkeep expense.

Our representative will visit your plant, lay out a system to fit your requirements, tell you what it will cost, and take your order, all without extra cost. This service will not obligate you to buy if our proposition does not prove attractive. We can send you literature, but valuable time will be saved by requesting representative to call.

MATHEWS GRAVITY CARRIER CO.

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RODGERS

"IN AGAIN--OUT AGAIN--GONE AGAIN"

IN AGAIN—day after day—go carloads of WET clay products through

RODGERS WASTE HEAT DRYERS,

and

OUT AGAIN—day after day—come carloads of BONE DRY clay products from

RODGERS WASTE HEAT DRYERS.

GONE AGAIN—day after day—to fill the continuous demand for SUCCESSFULLY DRIED clay products, are the daily dried carloads

If you LIKE the idea of doing business the "IN AGAIN—OUT AGAIN—GONE AGAIN"

RODGERS WAY

and consider carrying it out, you'll be taking the FIRST step by consulting the

L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
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Largest Manufacturers of Brick Drying Equipment in the United States

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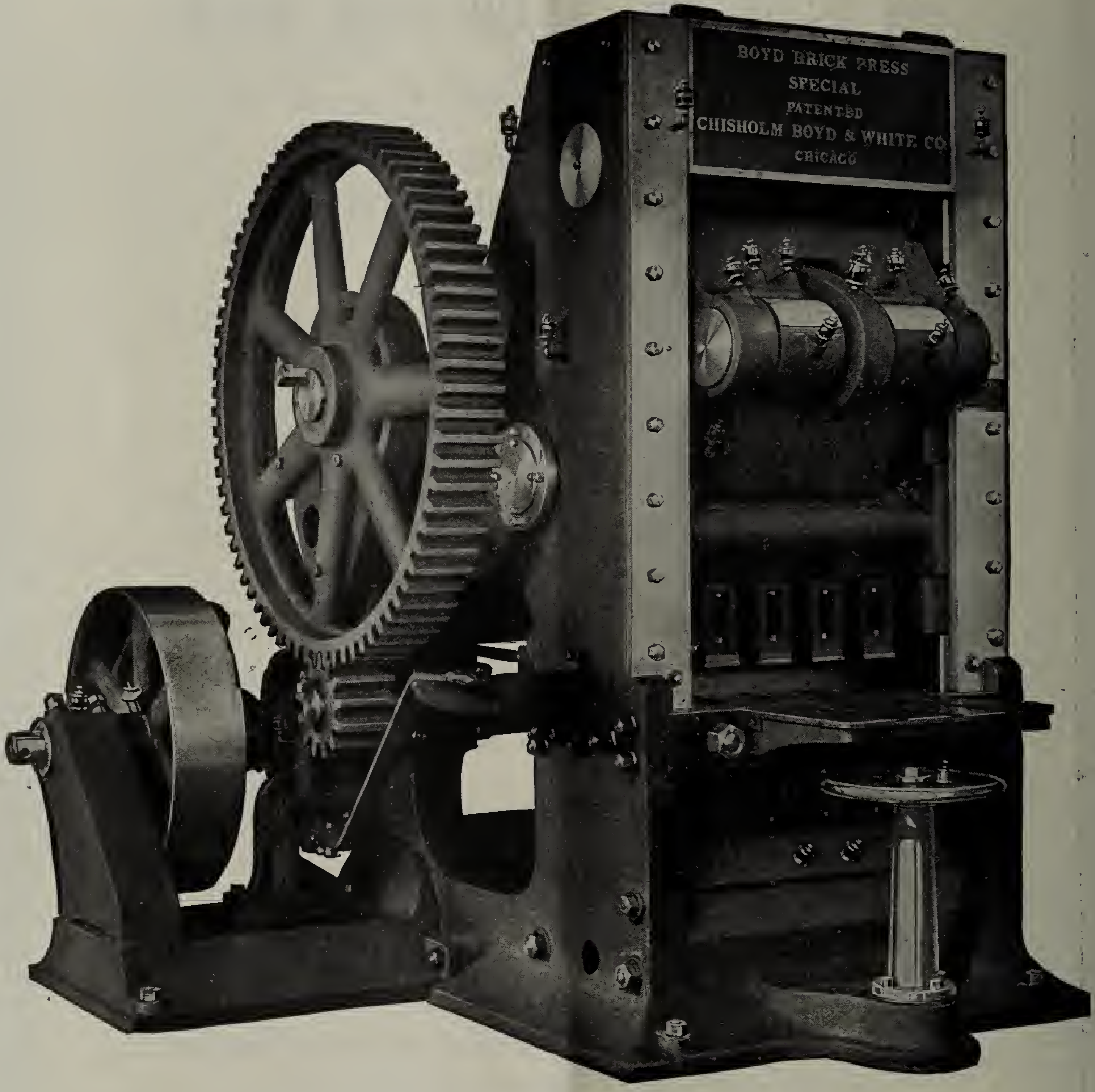
"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

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The Brown Instrument Co.
Beighlee Electric Co., The.

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Arch Cutting Apparatus.

Ceramic Supply & Con. Co.

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International Clay Mach. Co.

Automatic Cutting Tables.

(See Cutting Tables.)

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Freese & Co., E. M.
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Manufacturers Equipment Co.
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Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.

Roessler-Hasslacher Chem. Co.

Bearings, Roller.

(See Supplies.)

Belting.

Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
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Blowers.

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Trautwein Dryer & Engr. Co.

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Brick (Building).

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Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).

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Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
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International Clay Mach. Co.
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Potts & Co., The C. A.

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American Clay Machinery Co.

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F. W. Dennis.
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Schaffer Eng. & Equip. Co.
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(See Dryer and Dumping Cars.)

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Chambers Bros. Co.
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Frost Mfg. Co.
Potts & Co., C. & A.
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Lovejoy, Ellis.
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Martin Brick Mach. Mfg. Co., H.
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Clay Dryers.

American Process Co.
Schaffer Eng. & Equip. Co.

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Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
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Schaffer Eng. & Equip. Co.
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Koch, J. J.
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Ricketson Mineral Paint Co.
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Williams & Co., C. K.

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Orton, Edward, Jr.

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Lovejoy, Ellis.
Richardson, W. D.

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Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
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Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
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Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
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International Clay Mach. Co.

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Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
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(See Supplies.)

Cutting Tables (Brick & Tile).

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Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
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Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

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Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.

(See Supplies.)

Dies.

Louisville Machine Co., The.
(See Supplies.)

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Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
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Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
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Taplin-Rice-Clerkin Co.
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Ceramic Supply & Con. Co.

Drain Tile Machinery.

(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.

(See Supplies.)

Dryers.

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American Process Co.
Boss Co., John C.
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Fate Co., The J. D.
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Lakewood Engineering Co.
Manufacturers Equipment Co.
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Potts & Co., C. & A.
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Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

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Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.

(Continued on page 417.)

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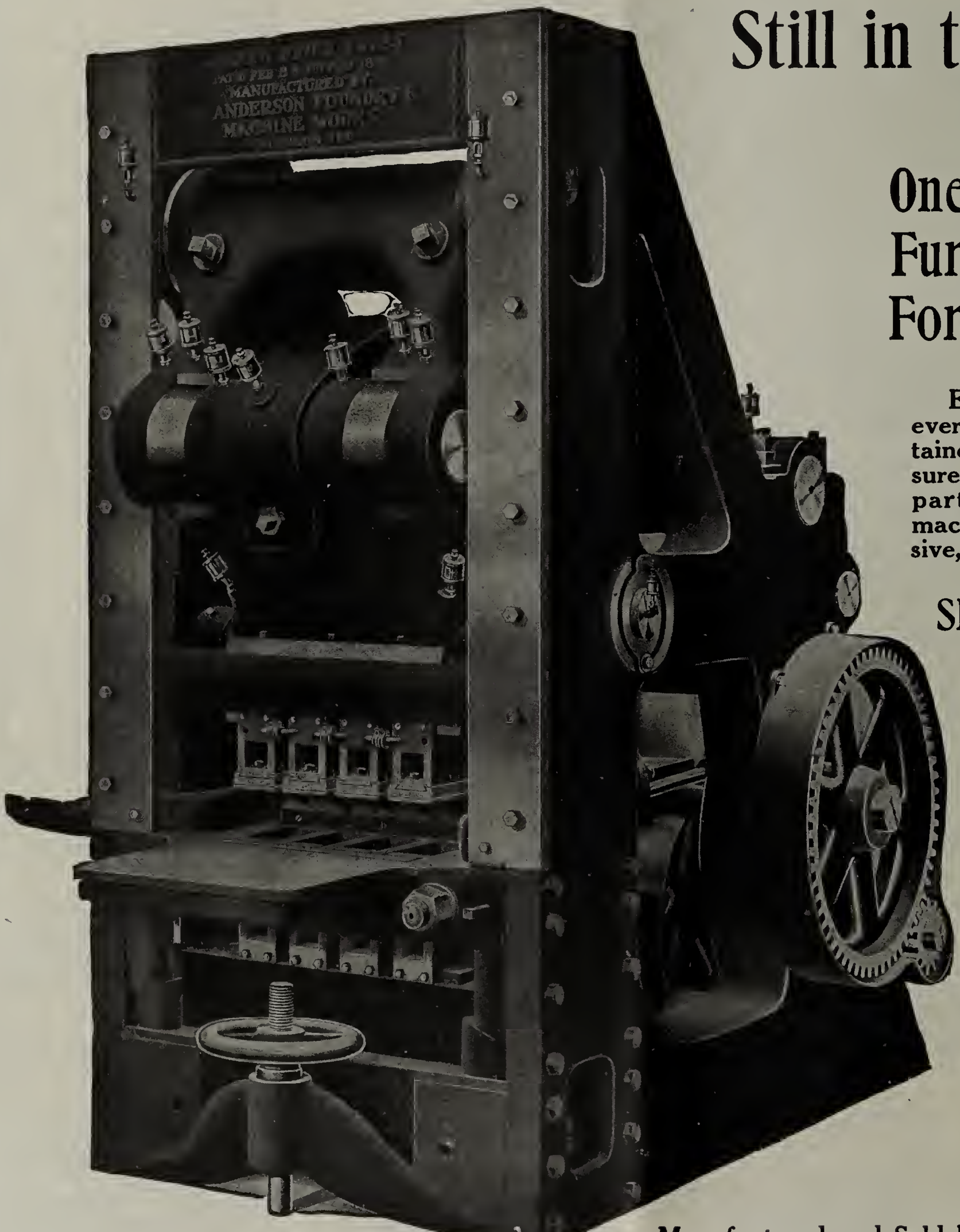
WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

Sold by the C. W. RAYMOND CO.
Dayton, Ohio

ANDERSON, IND.

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Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.
Wellington Machine Co.
Wilson, Thomas M.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Louisville Machine Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Beighlee Electric Co., The.
Brown Instrument Co., The
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

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Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
Beighlec Electric Co., The.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

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(See Conveyors.)

Engines.

American Clay Machinery Co.
Carrell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Lovejoy, Ellis.
Rodgers Engr. Co., The L. E.
Schaffer Eng. & Equip. Co.
Trautwein Dryer & Engr. Co.

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American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
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(Continued on page 419.)

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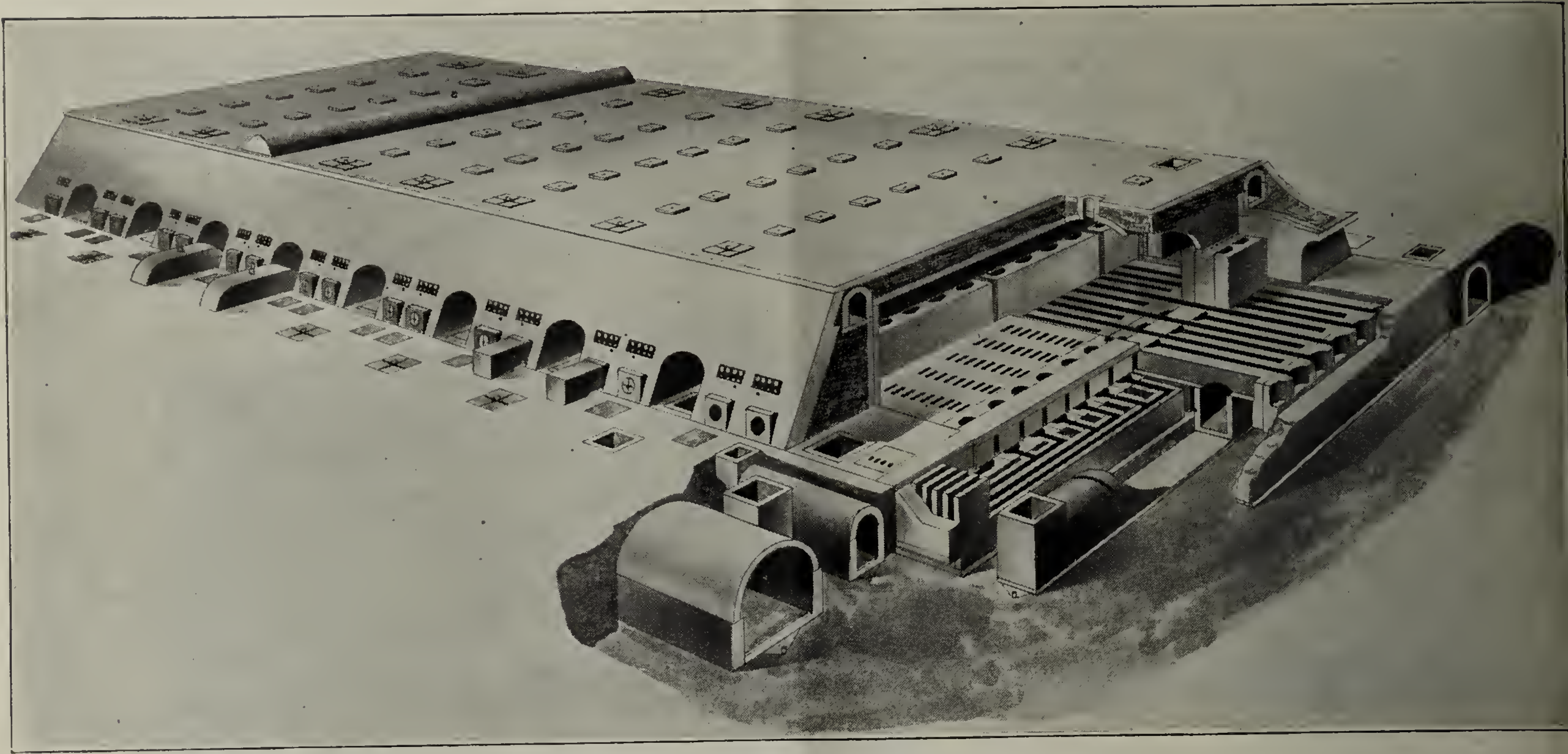

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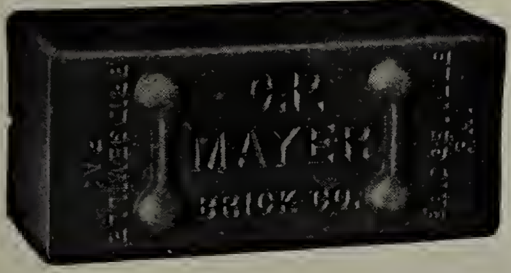

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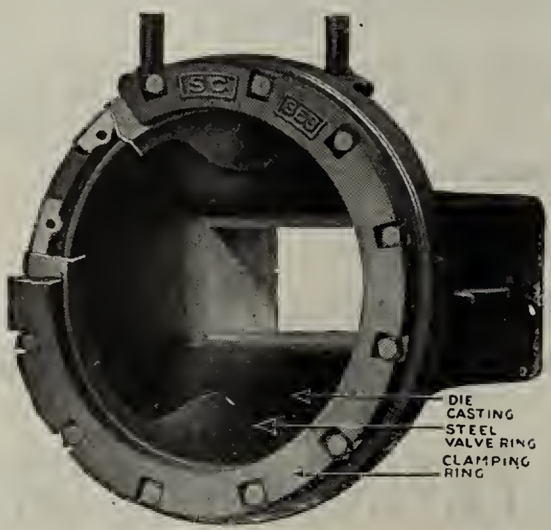

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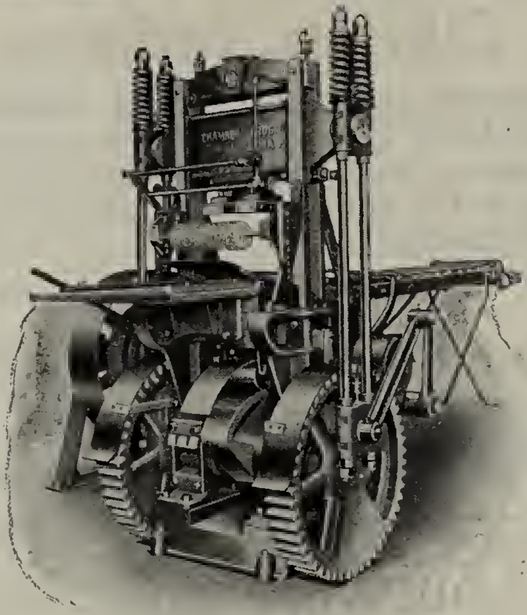

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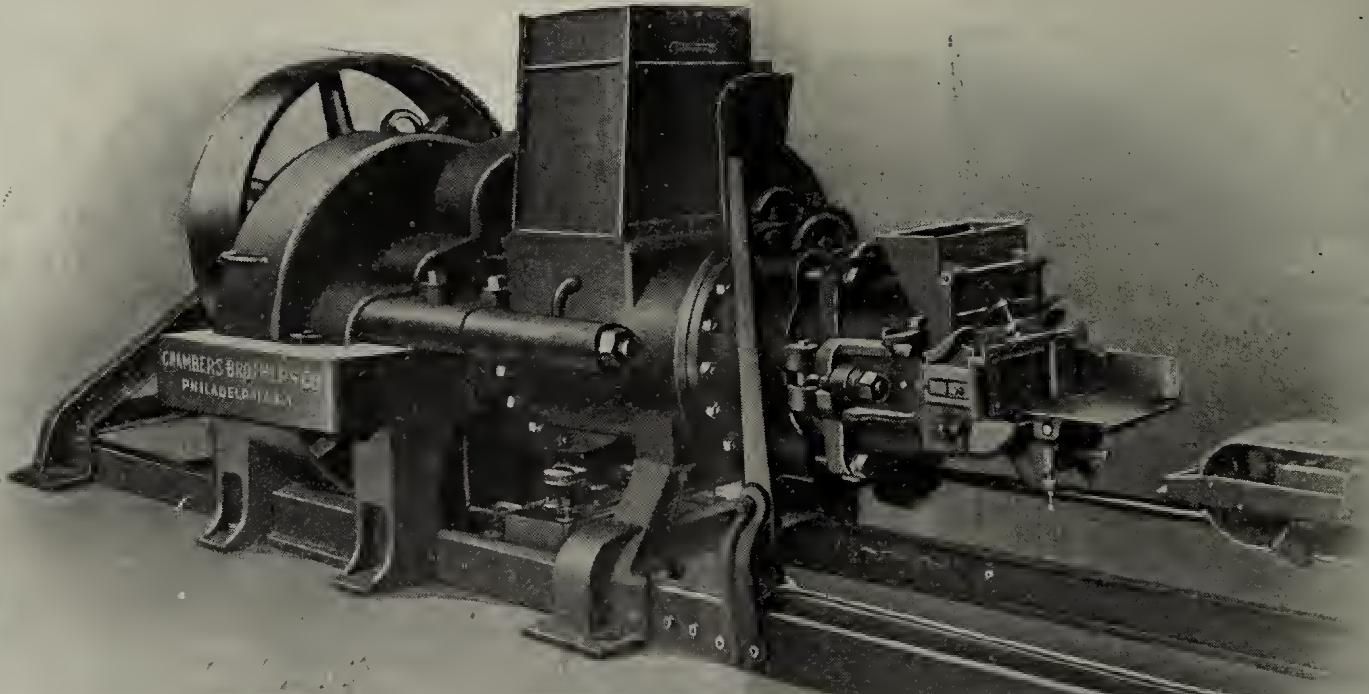

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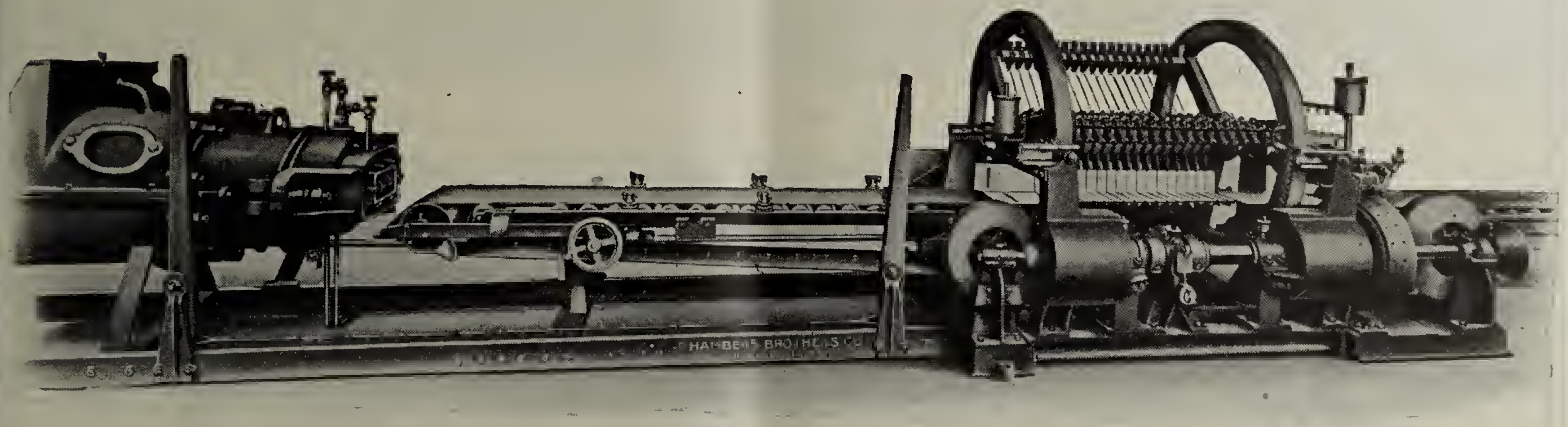

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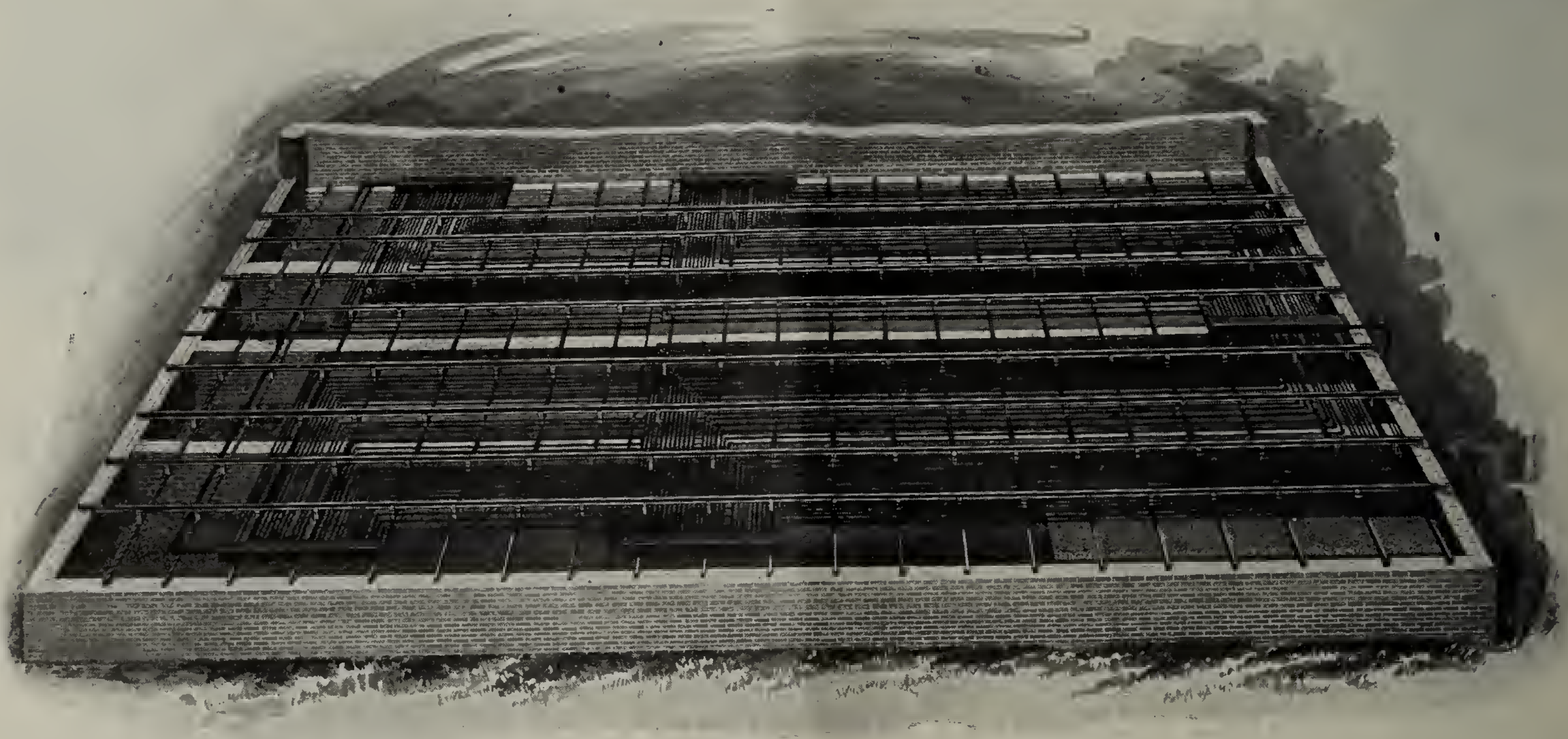

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. LXV. INDIANAPOLIS, IND., APRIL, 1916. No. 4

Written for The Clay-Worker.

BRICK FOR WALKS

Adds Beauty, Strength and Durability With Low First Cost and Little or No Expense for Maintenance.

THERE has lately been heard a sort of architectural cry for something other than the monotony of concrete for walks and for decorative purposes in landscape architecture. This cry is insistent enough and there has been enough development in the use of brick for the border of walks and for porch and pier construction to show that there is really a desire and a field for considerable extension of the use of brick—and to remind us that the brick men have figuratively stood by and let the concrete people monopolize the business in walks.

An Unusually Attractive Bit of Brick Work.

There is undoubtedly a fine field for the increased use of brick in hall and porch floors, in walks around the houses and in the porches, and there is a possibility that brick has more in its favor than even brick manufacturers have given it credit for in connection with the building of sidewalks of towns and cities.

Bearing on this point there is matter of considerable interest in a report prepared some time ago by C. J. Hendricks, a brick manufacturer of Woerden, Holland, on the brick sidewalks of Holland.

Holland is so situated and surrounded that brick is the most readily available material for sidewalks and it is easier to secure and apply than concrete, which is now the most common walk material in this country. As a result, they have developed brick sidewalks in Holland to a degree of satisfaction where it has more appeal, is more attractive than is offered by concrete.

In this report several points are made that are of particular interest, offering arguments in favor of brick. One of the disadvantages of concrete and asphalt covering that he points out is in the fact that the sub-soil is practically insulated.

"Moreover," he says, "if the roadway itself is also laid with a covering impermeable to water and air, it is necessary to place the water pipes, gas pipes, electric mains and pipe work of all kinds under the foot pavements where they can be easily accessible. It can be easily deduced from this that the covering for a foot pavement should not then be of too great homogenity. From the hygienical point of view it is further to be remarked that the street and foot pavement being covered with impermeable materials, there is a fear that the vapors and gases which may perhaps arise from the subsoil, will find their way out through the neighboring houses. This latter disadvantage for impermeable coverings is of great importance in Holland, a low lying country, and for a great part resting on a morass foundation. It is the double influence of the preceding remarks, and the fairly cheap cost, which has given rise in Holland to the consideration of brick as the best suited material for the paving of street sidewalks."

Then, after describing the process of manufacturing the brick used in Holland for sidewalk paving, he points out that among the qualities which render it particularly suitable for pavements are, the appearance of the paving is pleasing, the first cost low, the cost of maintenance is low, the paving retains its rough surface even under wear, there is no unpleasant dampness at the time of rains, and removals which may become necessary from time to time in laying water and gas pipes and the relaying of brick is carried out easily and calls for only a limited time loss and small expense. Among his deductions in the way of conclusions are that the ideal pavement should be as uniform as possible and of great resistance to wear. The surface should be rough in order not to become slippery under the action of rain. It should be rapid drying and it should not render the ventilation of the sub-soil impossible. And he argues that with due regard to the qualities of other materials that in Holland brick are used in great quantity of pavements, both streets in towns, as well as for roads in the open country, and they fulfill all the conditions outlined in his conclusions, both for heavy traffic paving and for sidewalks.

The speculative point this should arouse in the minds of all brick manufacturers interested in developing a further use of brick in paving and landscape architecture and in construction: Is it possible there may be before the trade for extensive developments for setting up a line of arguments and developing an order of exploitation that will result in many new uses of brick, and in so doing will bring not only more business to the clayworkers of the country but more beauty and satisfaction for the users?

The desire for brick has been strongly manifested the past year or two in the great quantity used for porches, in parapet walls and piers and there is now a decided inclination to use burned clay for porch floors and to decorate borders of concrete sidewalks with brick or burned clay in some form. So the time seems ripe for an order of exploitation that will feed and enlarge this desire and create a much more extensive use of brick even apart from the building of sidewalks proper. Then eventually it will probably be found that we too readily turned our sidewalk business over to the concrete people and that much of this may be reclaimed for brick by proper effort.

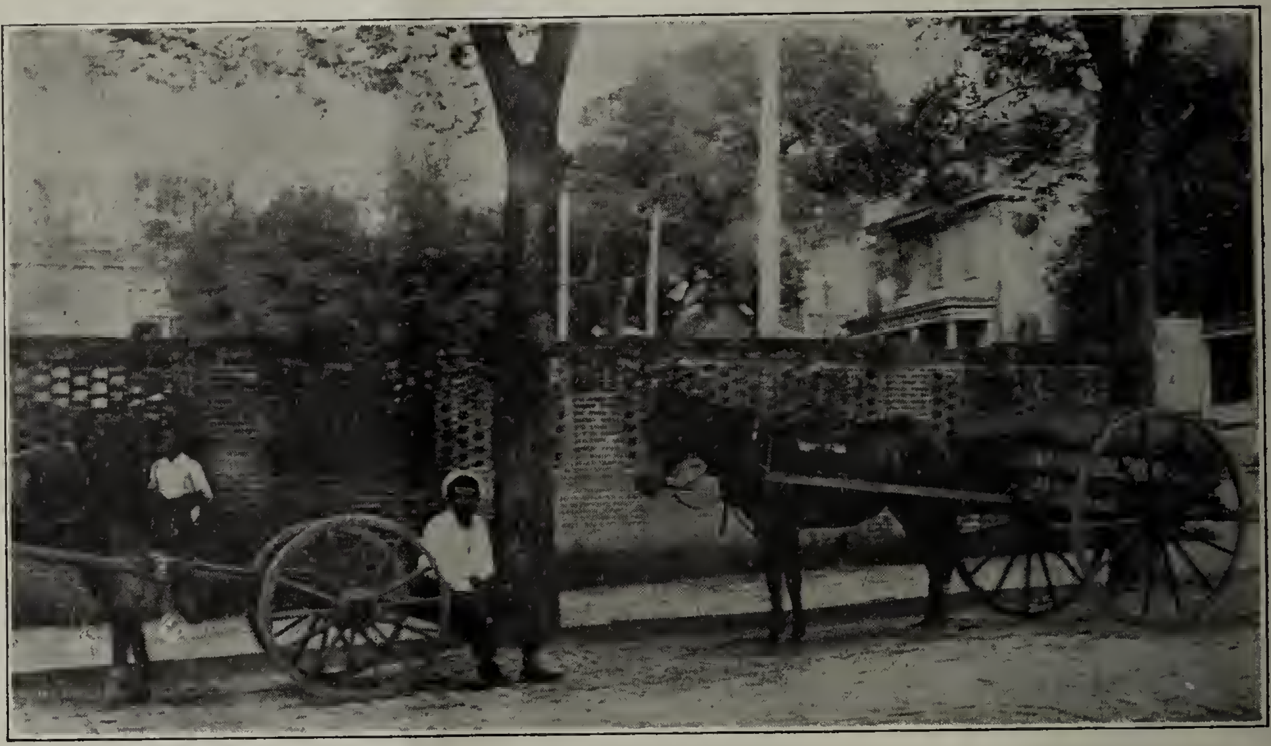

Figure 1. A Wilmington, N. C., Brick Garden Wall.

Some Brick Garden Walls.

Wilmington, N. C., has many good and many fine old residences "Built With Brick" and the example set by that city could be followed with advantage by many other larger and more modern communities. There are also many fine gardens in Wilmington and the garden there, does not seem complete without a brick wall 'round about it. Solid brick walls, unless elaborately panelled and otherwise decorated, give to much of the jail-yard effect to be appropriate for private gardens filled with rare shrubs and beautiful flowers and the type of wall shown by the halftones herewith, are free from the solid, prisonlike effect and also are very economical of brick, which is not usually the case when solid brick walls are made presentable by ornamentation as above noted.

Figure 1 shows several panels of the brick wall-fence, and incidentally reveals the usual sidewalk and street conditions incident to a southern city. Figure 2 (the illustration on cover of this issue) shows one panel of the wall and the method of constructing the base and cap, also the curtain wall, wherein lies the peculiarity of this fine structure. The posts, which have a pilaster effect, are about twelve inches square (1½ bricks) and the curtain wall is four inches thick, laid all with stretchers, with two-inch bearing and four-inch open space between the ends of adjacent bricks.

Some of the wall has a thick base, built upon the slope of the ground, or more properly speaking, built level and allowing the grade to run up and down according to the locality, as shown by Figure 1. The open-work, however, is run to the same height all along the wall, and the garden, inside the wall, is graded to a level, thus bringing the open-work portion the same height from the ground, all around the garden.

The posts shown by Figure 2 project four inches from the curtain wall. The posts or pilasters curved out four inches from the cap of the wall which portion consists of two courses of brick, the lower course being run cornerwise, showing a plinth effect and there are two solid courses below the angular course to bind together the open-work courses.

It will be noted in Figure 2 that the open-work does not extend quite to the posts, about one brick, or perhaps three-quarters of a brick-length being built solid adjacent to each post. This strengthens the curtain wall a good deal and adds to the effect to a marked degree. In modern walls, tile is often found covering the few courses of bricks above the curtain panel, but there is no tile to be found in this wall, just the plain brick cap two courses thick, and not broken around the tops of the posts therewith, from one end of the wall to the other. The trailing vines which surmount most of these walls is no small element in adding to their plain but pleasing effect.

But Wilmington is by no means alone in showing fine garden walls surmounted by trailing vines. Indianapolis can do something in that line, equally well with the southern city and a glance at Figure 3 reveals a garden wall crowned with vines, but the wall is of the solid, brick consuming type, with heavy pilasters, concrete base and cap. But the Indianapolis wall has been pierced for swinging doors, and a corner of the wall covered by a roof, thereby forming a comfortable and elegant appearing garage.

The wall forms two sides of the garage and the space between top of wall and garage roof is devoted entirely to pivoted sash, with barely room between, for posts to support the roof, which is flat and covered with felt waterproofing. The windows over the garage door are shorter than the side windows in order to permit sufficient door height.

This garage was built after the walls had been completed, therefore it was necessary to cut out the concrete base and put in an inclined drive-stone or threshold, level with the pavement of the alley upon which the door of this garage opens. The side with pilasters, is upon a street. The carpenter who built the roof of this garage evidently had an eye to the "fitness of things" as shown by the manner in which the water-cap above the garage doors is broken around so neatly that it appears at first sight as though the cap of the garden wall had been carried around over the doors.

In cutting through the wall for the garage doors, two new pilasters, one on either side of the opening, were constructed, but otherwise no change was made in the wall or its concrete cap. The water-table of the garage superstructure was placed directly on top of the concrete cap, well flashed, and no trouble has been caused by water getting inside the structure.

THE CLAY MARKETING BUSINESS.

AN INTERESTING phase of the clayworking industry worthy of special attention and study right now is that of the developing of quite a business in marketing clay. This business has already attained a magnitude of about $4,000,000 a year and promises considerable development in the next year or two, because of interruption to the trade in some of our import clays and the consequent discovery and development of satisfactory clays in the United States for the same purpose. Also there are possibilities of general development in the clay business as a distinct line from clayworking.

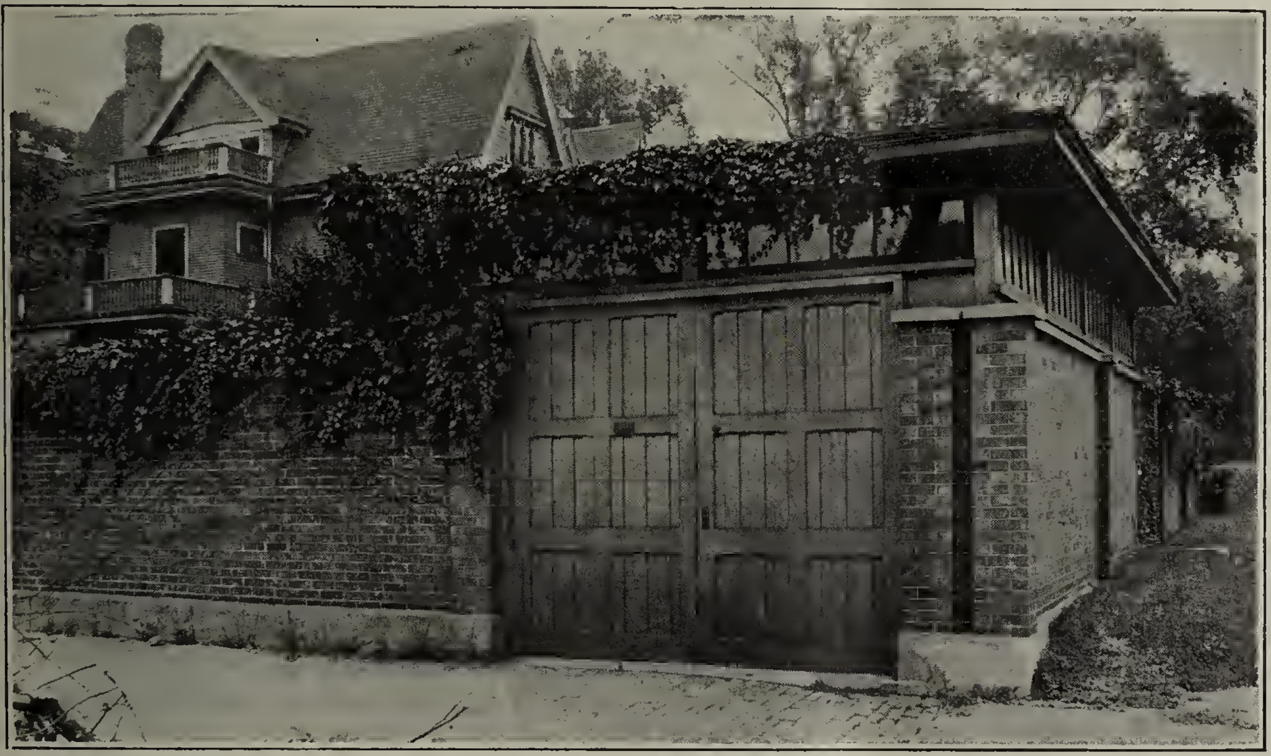

Figure 3. An Indianapolis Garden Wall and Garage.

Because clay available for making brick and many of the other burned clay products is one of the most widespread of minerals, so that it is usually easily obtainable in almost any locality, there has not been any rapid development in the business of marketing clay itself. But as a press bulletin from the U. S. Geological Survey says, as we approach the higher grades of clays we find that more of the clayworkers depend upon others for their supplies and fewer of the manufacturers are miners of their own clays. This is the main branch of development in clay marketing, that of high-grade and special clays for special purposes; but in time, just as in the lumber business, we have developed a timber and timber marketing industry at the raw material end, so may we eventually develop a clayworking and marketing industry as one of some magnitude, even in the commoner clays.

Anyway, we are making some interesting progress in developing the home market in special clays. An illuminating instance of this is furnished by the fact that the American glass manufacturers thought they were in trouble when the importation of clays from Europe was cut off by the war. The Pittsburgh laboratory of the Bureau of Standards got busy, however, working in co-operation with the clay pottery industries, and among them they have demonstrated that we have clays here that will serve all the needs of glass manufacturers by proper mixing. In fact, it was found that a mixture prepared of American clays proved superior in the glass corrosion tests, both to the mixtures prepared with German clays alone and to those prepared from American and German clays combined.

In reporting on these tests the director of the Bureau of Standards says that the value of the results of this single investigation to American industries far surpasses the total amount the government has expended in the clay products work since the time of its organization. Also the opinion is given by those in charge of the experiments that, from now on, no foreign clays will be needed in the glass factory branch for pots and other refractory products.

It is things like this that impress us with the idea that we are on the eve of extensive development in our clay marketing industry, and that the next few years should see this business attain considerable magnitude and prove beneficial, both to the users and producers of clay.

Heretofore the main clays mined and marketed have been fire clays and kaolin and special pottery clay, with fire clay making up the greatest total quantity and value. Last year there were 1,409,467 short tons of fire clay mined and marketed at a value of $2,147,277. This was not the highest production on record, because last year was a comparavtively slow year all around, and if prosperity reigns we should see a very marked increase over this during the next year.

The kaolin production was 34,191 tons in 1914 valued at $284,817. This was some increase over the previous year because domestic kaolin perhaps had to replace quite a lot that heretofore had been imported.

The production of ball clay showed an increase, too, notwithstanding it was a dull year, for perhaps the same reason that kaolin showed an increase. The total production of ball clay was 67,927 tons, valued at $255,767.

The kaolin and ball clays find their use mainly in the making of high-grade pottery, and as we extend our own export trade and supply our own raw material needs, we should find a material increase in the volume of business done in kaolin and ball clays.

In the business of mining and marketing clays, Pennsylvania has practically always been the leading state, furnishing about one-fifth of the total clay supply. Fire clay is the main product from Pennsylvania, of which 306,183 tons were marketed in 1914, with a total value of $519,505.

New Jersey is a pretty close second to Pennsylvania as a source of clay supply, reporting 373,703 tons marketed in 1914, with a total value of $648,584. This was more than the total of Pennsylvania for fire clay, but counting all the Pennsylvania clay products, they totaled $715,458.

In New Jersey, as in Pennsylvania, fire clay was the leading product constiuting about three-fourths of the total value of the clay output.

Ohio, which is the leading state in clay manufacturing, was third in the quantity and fifth in the value of clay marketed in 1914, while Missouri was fourth in quantity and third in value. Illinois was fifth in quantity and sixth in value, and Georgia was sixth in the production and fourth in value.

The six states of Pennsylvania, New Jersey, Ohio, Missouri, Illinois and Georgia furnished about 70 per cent. of the total clay marketed in 1914. They will perhaps continue in the lead, too, but from present indications there will be considerable new development in the next few years in the mining and marketing of clays as a separate industry from that of clayworking. This is as it should be, and we hope in time to see a great clay marketing industry and to see this industry represented in the advertising pages of The Clay-Worker[1] and properly exploited before those who can make good use of it, for we have a feeling that one of the great future industrial developments in this wonderful country of ours is to be in clay mining and marketing as well as in clayworking and the use of burned clay for building purposes.

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give some papers read before the meeting of the American Ceramic Society at Detroit, and reprinted by permission from Volume XVII of the Transactions of the American Ceramic Society.

EXPERIMENTS TO OVERCOME SCUMMING AND IMPROVE THE COLOR OF BRICK.

By A. E. Williams.

The production of black and dark-brown brick has come to be an important consideration to the face brick manufacturers. Many red-burning clays and shales are in use which will not withstand the severe reducing conditions and high temperatures necessary to produce these desired colors, or will not flash as easily as others because of differences in their physical and chemical composition. In the following work experiments have been made in an attempt to develop an inexpensive method of producing these desired colors on such clays and shales.

The best method which suggested itself was to treat the surface of the column, as it issued from the die, with solutions containing salts of common metals.

Experiment I. Solutions used:

(a) Approximately 0.7 normal solution ferric chloride ($FeCl_3$) analyzing 113 grams Fe_2O_3 per liter.

(b) Approximately normal solution ferrous sulphate, using 300 grams $FeSO_4$ per liter and testing about 156 grams Fe_2O_3 per liter.

These solutions were sprayed on a column of clay as it issued from the die, using a clay which burned to a fair red color, but did not flash very dark at ordinary kiln temperatures.

Samples having both the smooth and rough or mat surface were cut from the treated column. Dry brick from two factories in Illinois were also sprayed with these solutions. These brick were all placed in a steam dryer for two days, and then burned in an open-fire down-draft test kiln. Samples were drawn from the kiln as follows:

1. Drawn at 1100° C., with kiln conditions oxidizing.
2. Drawn at 1150° C., two hours later, burning with gas conditions alternately oxidizing and reducing.
3. Drawn at 1200° C., two hours after drawing second trial and burning with gas conditions reducing.

The results obtained are given in the accompanying table, which lead to the following conclusions:

1. Treating dried brick with ferrous sulphate or ferric chloride gave no satisfactory results.
2. Treating the clay column while still wet showed an improvement in the color, principally by giving a surface free from whitewash.
3. Ferric chloride was much more effective than the ferrous sulphate.
4. A slight amount of flashing gave brick a darker color when treated with $FeCl_3$.

Experiment II. As a continuation of these experiments, another set of samples was made, using the same clay, which was treated in the stiff-mud condition in the first experiment, and two other clays which were known to scum and give a generally poor color when not treated with barium compounds.

Five sets of trials were made from each clay, as follows:

1. Rough and smooth faces not treated.
2. Rough and smooth faces treated with ferrous sulphate.
3. Rough and smooth faces treated with ferrous sulphate, then with ammonia to precipitate ferric hydroxide.
4. Rough and smooth faces treated with ferric chloride.
5. Rough and smooth faces treated with ferric chloride, then with ammonia as in set No. 3.

These bricketts were placed in saggers, covered well to prevent any flashing effect of the open fire, and burned to 1150°C. in 36 hours. The results are shown in Table I.

This experiment confirmed the conclusion from experiment 1, that ferric chloride was actually overcoming the effects of scumming.

Experiment III. The effect of volatilizing ferric chloride in a kiln was also tried. The test kiln was set with half-brick and burnt to 1000° C. in 48 hours. One-half pound of ferric chloride was then put in each of the two fire boxes, the damper closed until the fumes were coming very slightly out of the fire boxes, and the kiln kept in that condition for one-half hour. The kiln was then fired in the regular manner and samples drawn one-half hour later. This treatment seemed to have had no appreciable effect on the color.

The temperature of the kiln was then raised to 1100° C., and ferric chloride used in the same manner as before, but with the same results.

Finally, the kiln was finished at 1150° C., at which time a third treatment of ferric chloride was given, after which firing was discontinued and the kiln cooled in the regular way. When the kiln was opened everything was flashed to a dark-brown color, but whether or not the high temperature and

SAMPLES NOT TREATED	1ST SET	CLAY TREATED WET	CLAY TREATED DRY
Pale red. Signs of scumming.	$FeSO_4$	Pale red as clays not treated.	Pale red as clays not treated.
	$FeCl_3$	Darker red — no scum.	Pale red as clays not treated.
	2nd Set		
All scummed and have dirty gray color. Flashing not effective.	$FeSO_4$	Grayish brown; better than sample; not treated.	Same as sample, not treated.
	$FeCl_3$	Chocolate brown, good color.	Same as sample, not treated.
	3rd Set		
Flashed shiny black.	$FeSO_4$	Flashed shiny black.	Flashed shiny black.
	$FeCl_3$	Flashed shiny black.	Flashed shiny black.

somewhat reducing condition was as much the cause of the color as the ferric chloride is an unsettled question.

The results at this time indicated that ferric chloride was assisting the flashing somewhat, but more especially was producing good, clean, red colors, free from scumming. Comparing the cost of ferric chloride with the cost of barium compounds, and also the relative quantities used, the cost of using ferric chloride would be considerably cheaper, costing about 2 cents per thousand brick. The balance of the experimental work was therefore done on a commercial scale at three different factories where a considerable amount of barium is now being used. The results in detail are given below.

Table I.

Set No. 1	Set No. 2	Set No. 3	Set No. 4	Set No. 5
Rough and smooth faced samples showed scummed surfaces with grayish color.	Rough faced samples appeared considerably better than untreated samples, but did not give a clean red color. Smooth face samples not much improved.	Same as No. 2.	Rough faced samples showed good clean bright red. Smooth faced samples greatly improved.	Rough and smooth faced samples showed good clean red color, except where there was slight flashing.

The method of spraying the column of brick on a commercial scale was tried, but gave considerable trouble, and the simple but effective method of using a roller 3 inches or 4 inches in diameter, and covered with lamb's wool, placed in front of the die, was adopted. The ferric chloride solution was allowed to drop from glass stop-cocks onto the roller.

At one factory about six thousand brick were made with a solution of one-half pound commercial ferric chloride per gallon of water, which was applied to the column at the rate of one gallon per six thousand brick.

At another factory three trials were made, using one, one and a half, and two pounds of commercial ferric chloride per gallon of water and spreading the solution on at the rate of one gallon per three thousand brick. All of these trials resulted in a failure so far as removing the scum was concerned, although the last trial using two pounds per gallon of solution produced an appearance on the brick similar to that found when barium compounds had been added in an amount not quite sufficient to completely remove all of the scum, forming a rather pimpled effect, with the under color good. It is intended that further practical tests of this sort will be made in an effort to overcome scumming.

The reason for the effects of ferric chloride in reducing the scumming are not as yet clear. $Fe_2Cl_6.6H_2O$, either alone or mixed with powdered gypsum, gives up a large quantity of HCl below 200° C., and the last traces are driven off below 250° C. There is no evidence of SO_2 being present in the gases expelled from the mixture of ferric chloride and gypsum, and therefore no indication of the decomposition of the sulphate.

The fact that the trials treated with ferric chloride and ammonia showed as good a color as the trials treated with ferric chloride alone would lead one to believe that the improvement is not due to the free HCl evolved.

It is shown by H. O. Hofman and W. Mostowitsch[1] that the presence of SiO_2 or Fe_2O_3 lowers the dissociation temperature of $CaSO_4$. In heating with SiO_2, decomposition was first indicated by the evolution of SO_2 at 1000° C.; with Fe_2O_3, dissociation of the sulphate was first indicated by the evolution of both SO_2 and O at 1100° C.

This may explain why such results are obtained in a test kiln, using temperatures above 1100° C., and not in a commercial kiln using temperatures between 1000° and 1050° C. The sulphates coming to the surface in the process of drying brick would, no doubt, become more or less mixed with the ferric oxide present, and this condition would compare favorably with the experiments of Hofman and Mostowitsch. On the other hand, the entire effect may be simply one of covering the scumming.

Further experiments in producing dark colors were made in commercial kilns by the introduction of manganese chloride and copper chloride into the kiln at the completion of the burn.

The burns in which these salts were introduced were carried on under oxidizing conditions, and the resulting colors would ordinary have been light chocolate on the brick in the top ten courses and a red color in the lower part of the kiln. At the finish of a burn, after the fires had become free from flame, twenty-five pounds of manganese chloride was put into the top hole of the kiln crown, and the damper of the kiln nearly closed. There was evidence of fumes going through the kiln over a period of about five minutes. The damper was left closed for one-half hour, however, and the kiln finished in the regular manner. The brick in this kiln were well blackened, in the form of an inverted cone from the top about half way down. In all probability, if this kiln had been flashed for black brick an even larger number would have shown the effects of the manganese. However, this gives a method of blackening ware without flashing it to a very great extent and risking the results of overburned brick.

The price of manganese chloride at the time these experiments were made was about 6 cents per pound, but since then it has been advanced very considerably in price.

Treating a kiln with copper chloride in the same manner as above gave no marked effect. If anything, only a slight tendency to give a brown color might be attributed to it.

The volatilization of ferric chloride in commercial kilns has not yet been tried. It is possible that this salt will assist in giving a black color.

Summary. 1. Treating the surface of a stiff-mud clay column with ferrous sulphate did not markedly affect the color in burning.

2. Treating the surface of a stiff-mud clay column with ferric chloride did improve the color, evidently by removing the scumming, but as yet no good results in commercial kilns have been obtained.

3. Manganese chloride, volatilized in brick kilns at the finish of a burn, produced dull black colors with but little previous flashing of the kiln.

4. Copper chloride gave very little evidence of darkening the color of the brick.

In conclusion, the writer desires to acknowledge his indebtedness to his co-workers of the Department of Ceramic Engineering, University of Illinois.

THE PRODUCTION, MANUFACTURE AND USE OF COMPOUNDS OF BARIUM.

By Warren E. Emley and S. Eccles Young.[1]

THE amount of barium salts annually used in the United States is rather small as expressed in dollars and cents, but they find their way into so many industries that they have become commercially quite important. Thus, the sulphate is used in the manufacture of paint, paper, rubber, leather and textiles; the peroxide for making oxygen, and the carbonate and chloride are valuable reagents to prevent the efflorescence on brick. The natural growth of this last use

(Continued on page 496.)

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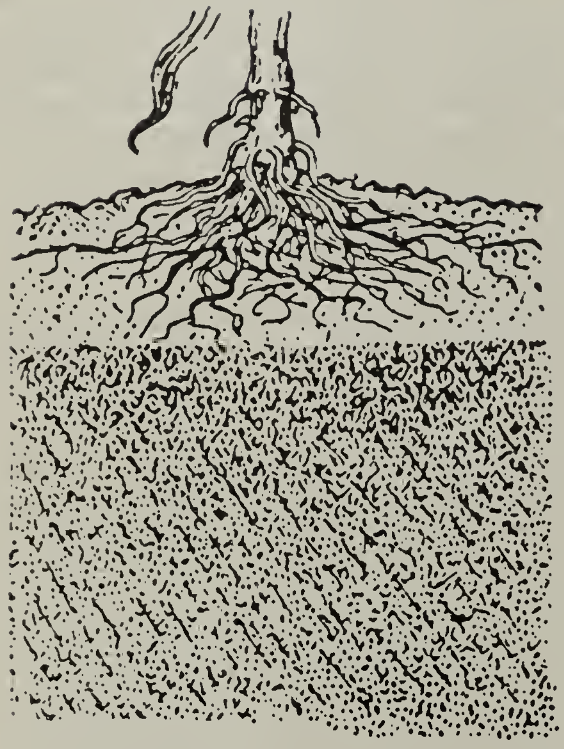
[1] The Behavior of Calcium Sulphate at Elevated Temperatures with Some Fluxes. *Transactions Inst. of Mining Eng.*, Vol. 39, page 628.

[1] By permission of the Director, Bureau of Standards.

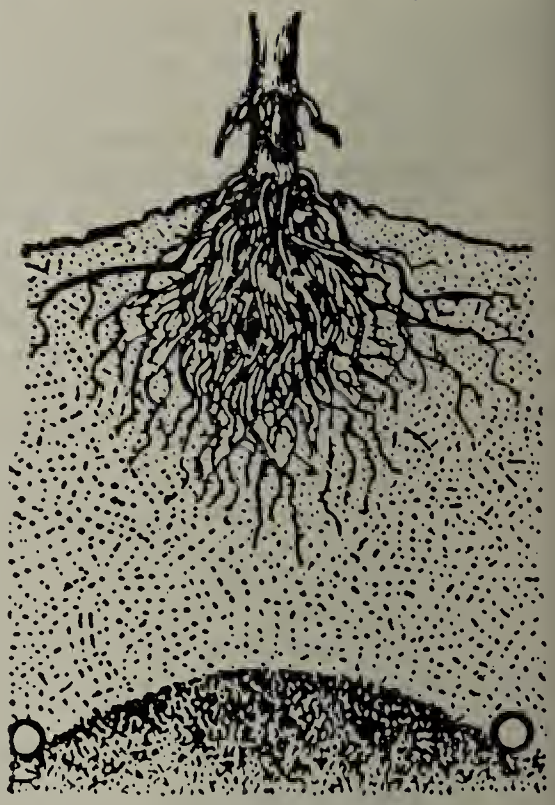


Root Development of Corn in Poorly Drained Soil.

Influence of Drainage on Growth of Alfalfa.

The Experience of One Man Who Tiled His Land and as a Result Raised Good Crops of Alfalfa.

By J. E. Randall.



In Well Drained Soil Roots Go Deep and Are Not Affected by Drouth.

"WELL SIR, answering that question, I'd say you can't separate the two, for tile underdrainage is the chief essential in good alfalfa growth."

I was talking to a successful farmer who owns hundreds of acres of land and knows the A B C's of nearly every thing that is connected with farm and farm life.

"You see those fields of alfalfa over there? I've grown nothing but alfalfa on them for the past sixteen years and I get 'round five tons to the acre annually. I can just sit here and let it grow, it does not need the care other crops do. Year in and year out I cut those fields three times a season and never reseed. I just run over the ground with a spring toothed harrow after each cutting.

"Of course it wasn't that way in the beginning. That land was cold clay land and too wet for any kind of crop.

"The only thing for me to do if I were going to make my land worth anything at all was to change that condition, for the previous owners went broke trying to grow crops there without changing the soil much. Oh they plowed it and put manure on it but that didn't do any good for the land was dense and wet. The crops were bound to be drowned out. The soil had to be made porous and the excess water removed. Drainage was the only sensible thing to do.

Doubled His Crop.

"I studied the subject carefully, knew I had to tile drain that land and determined that tile should be put in systematically or not at all. When I tiled I hired an expert and had the systems laid according to the requirements. My tile are 30 inches deep and all the lines sixty feet apart. Do you know I was surprised myself at the wonderful change the tile made in that land the first year. Every bit of the expense and more, was made back right off the jump for I raised double the crop I had before and the beauty of the whole thing is it seems to get better every year. I've made up my mind that I can't tile too much, for it opens up the soil, removes that excess water and allows the air to circulate down deep.

"It was like trying to plow over a board floor before, that ground was so hard and dense, and there wasn't much life in the soil either because the ingredients needed in the land from the rains and manure had been washed away into the gulleys by the surface washings simply because the ground was too dense. The rains and melted snows could not percolate very far.

"It was a hard job to get scarcely any kind of a crop before I tile drained. But when I had those tile working for me there certainly was a surprising change. The ground was easy to plow, the soil was rid of its dampness and close structure and there wasn't the surface washing. The water would not stand in that ground after a rain for the tile carried

Two scenes on adjoining farms referred to in article. Field on left produced three good crops of alfalfa a year, due to the underdrainage. Field on right grew a crop of oats and a crop of weeds; it had no tile drains.

it off but the fertilizing elements needed in the soil were retained and not washed into the gulleys.

Limestone Sweetened the Soil.

"Of course I put on a liberal quantity of ground limestone to sweeten the soil before I did any planting and then I went to it. That alfalfa grew wonderfully and has never given me one bit of trouble since. I attribute my success in growing alfalfa to the fact that I have a well tiled farm and sweet soil. So when you ask me what I think of the influence of tile underdrainage on good alfalfa growth, I simply have to admit that I can't separate the two for I don't believe you can grow good alfalfa on any but tiled ground.

"Tile underdrainage is essential in the growing of any crop if you want to make big profits but it is more essential in growing alfalfa or the other deep rooted plants, than in growing any other kind of crop. For corn you need a deep clay loam while for wheat a lighter soil will do, rye you can grow in most any place but tile underdrainage will give your land a big advantage over your neighbor's if his is not tile drained."

He turned suddenly in his walk over his alfalfa field and pointed to a field of an adjoining farm covered with weeds.

Weeds or Alfalfa.

"Do you see that mass of weeds over there across the road? Well that belongs to a neighbor friend of mine who is going to tile in the spring. His soil is exactly as mine was once but he hasn't been able to grow alfalfa because the ground is too wet. He has tried it for years now and has finally made up his mind to follow my example. All the lime and manure in the world wouldn't make that land good for alfalfa without a drainage system. Doesn't that field of weeds and the knowledge that he has tried it time and again prove it? Of course it does. I am going to plant twenty acres more in alfalfa this year. I'll break ground in the spring and cultivate it until the last of July running an alfalfa harrow over it about every ten days. Then I'll sow it with a drill using about eighteen pounds of seed to the acre. Another good way to start growing alfalfa is to sow in oats or barley and then your alfalfa.

"I like to use plenty of lime and phosphate. They do the soil a lot of good. I'll use four to six tons of ground lime rock this year, applying it with a lime spreader. I think 200 pounds of 16 per cent acid phosphate to the acre is about right. It gives good roots. The best time to put in the phosphate is just after the cutting when you're running over the ground with a fine toothed harrow.

"I cut my alfalfa three times a year, the first about June 1st, the second about the middle of July and the last in September. Alfalfa brings a good price, I sold some recently for $15 a ton. It makes the finest feed possible, we keep our horses fat through the winter with no other feed. We don't have to feed them any grain at all."

Alfalfa Roots in Tile.

I asked him if he had ever heard of the alfalfa roots entering the tile and being bad in that particular and he replied that it was not reasonable to think that alfalfa could give any trouble in that respect. "Why the alfalfa roots are fine and are near the surface except for the one main root which, of course, sometimes penetrates to a depth of fifteen feet. These main roots do not interfere with your drains because they would not go through, but would go around or probably miss the tile entirely. Why I've grown alfalfa for over twenty years and have never had one single bit of trouble with my drains."

Hundreds of farmers in Indiana are enthusiastic advocates of tile underdrainage. This is due to the simple fact that it is the best dividend producing item on the farm. No matter how splendid the condition of your soil, you can improve it, you can get a larger production of any crop by the use of tile underdrainage. Especially is tile underdrainage absolutely necessary in the good growth of alfalfa. There are but few sections of land in the State of Indiana that cannot grow alfalfa with the proper preparation of the soil.

Probably every farmer in the state really desires to grow alfalfa, but many are under the impression that their land is not suited for raising it. If he will only try out a part of his farm, put in a good sytsem of tile underdrainage, make the soil sweet and make a good seed bed, and thus prepare his soil before planting, he will prove to his own satisfaction the great opportunity he has neglected. Remember this: Alfalfa needs a dry subsoil, and the tile underdrainage makes this possible. On most land the tile should be put in every sixty feet, and a liberal application of good lime rock made. This will make a good stand of alfalfa.

The influence of tile underdrainage on good alfalfa growth can not be expressed by words. It is the profits in dollars and cents that speak unmistakably of its great value and importance.

MR. TILE MANUFACTURER:

The above article is published with the idea of presenting to our drain tile readers a bit of publicity matter which they can offer to their local or county newspapers. Local editors will gladly reproduce articles dealing with subjects of this type if properly approached. This kind of advertising should not cost the tile manufacturers one penny, although in some cases it might be well to run a small advertisement in the issue in which the article appears. If you contemplate placing an advertisement in your local papers, we would suggest that you use the catch line, "The Best Dividend Paying Item on the Farm," in referring to tile underdrainage.

There are many other ways of placing your product forcefully before the attention of the farmers in your territory. We urge upon our drain tile readers to take advantage of the suggestion made several times in our columns during the past year or so of the Rural School Prize Competition. Offer a prize or prizes ranging from $5.00 to $2.00 for the best essay written on the subject, "The Benefits of Tile Underdrainage," or perhaps better the subject, "Why I Should Tile Drain My Farm." The teachers will be glad to co-operate with you in this matter. Every youngster likes a contest, so you will have no difficulty arousing interest in the competition. The scholars will take the proposition home with them, make inquiries of their parents, who in turn will discuss same with the neighbors. In this manner you are creating an interest in the subject of tile underdrainage of inestimable value. When the essays have been presented and the judges have made their awards, the entire country covered in your competition will have a second thrill and a renewed discussion will ensue. Save the prize essays and use them in your circular matter.

DRAIN TILE IN OREGON.

Phil Withycombe, of Yamhill, Ore., is considering the advisability of adding a brickmaking department to his tile manufacturing plant.

The Warrenton Clay Company, at Warrenton, Ore., which concern has been reorganized, is to erect immediately a plant for the making of drain tile, sewer pipe, hollow building tile and common brick. A building of three and a half stories will be put up, where the main operations will be carried on. The company has fifteen acres of land and is conveniently situated in relation to railroad and water transportation. The capital stock of the company is $125,000.

Talk with a big, progressive farmer who has tried tile draining, and you will find him anxious to use more of it, and that is the best kind of a recommendation to use with others.

BRICK IN THE LUMBER YARD.

THE Southern Pine Association, the most enterprising of the lumber boosting organizations, has recently issued a series of "red light" warning signals to awaken the lumber fraternity in a sort of startling manner to needs for boosting lumber.

There is reproduced herewith one of these, known as "red lights No. 3," which is interesting for two reasons. In the first place, it shows one line of activity of the lumber boosters, and in the next place it illustrates the fact that brick constitutes an item in the lumber yard trade.

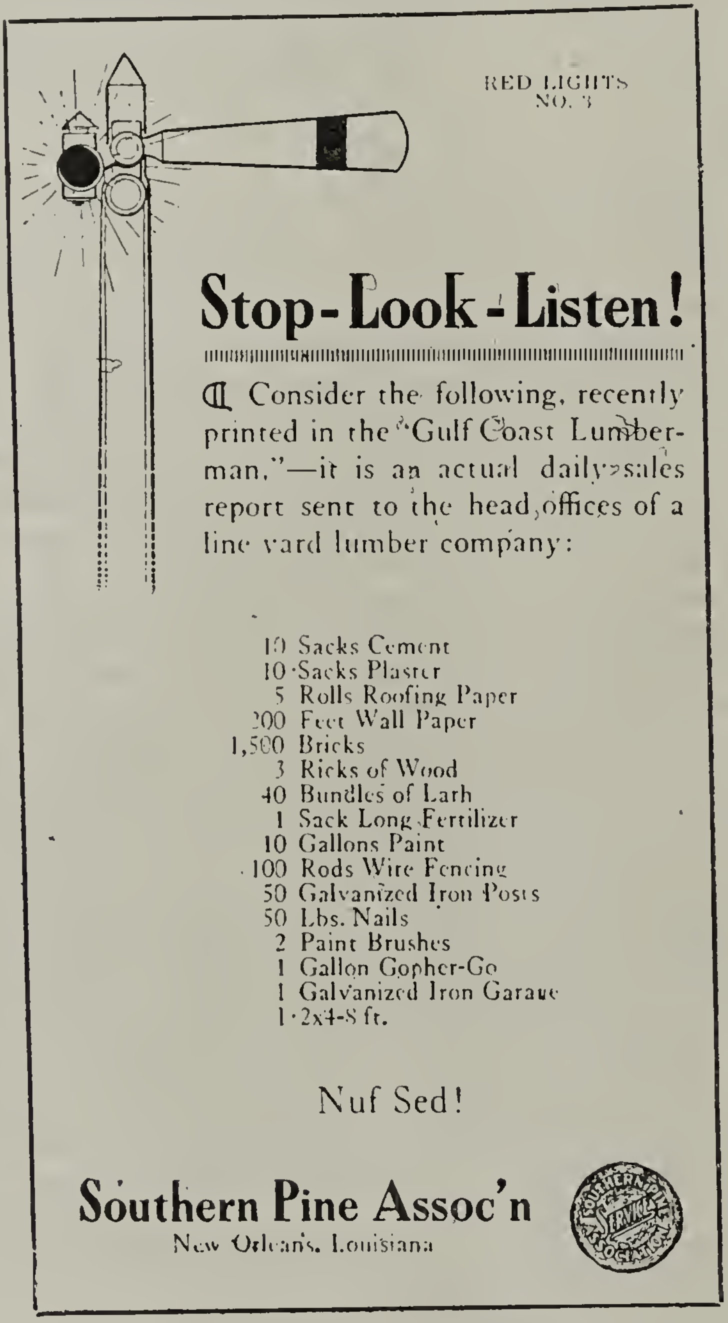
In this instance the daily sales are taken from a retail yard, or rather the record of one day's sales, which perhaps was unusual, for only one little piece of lumber was sold, whereas a number of other items, not lumber, were sold, including 1,500 brick.

This is probably very unusual, and a similar daily sales report will not be found on an average once in one hundred times, and because of this unusual nature, it is held up as a warning example of the way other building material is encroaching upon the sales of lumber in the retail yard.

There is no question but what the wide-awake retail dealer in lumber is going to include in his stock all other building material that can be handled profitably by him. The best counsellors of the retailers advise them to come as near as possible to carrying everything that goes into a house, from the foundation to the chimney top, which naturally includes many other things besides lumber.

The point of interest to the clayworking fraternity in this particular instance is that item of brick. Brick, by rights, should be an item in practically every retail lumber yard, and not only brick, but fire clay flue linings, fire brick for fireplaces, sewer pipe, drain tile, and even roofing tile. The amount of this kind of stock carried by the retailer in the future can be enlarged materially by proper boosting effort on the part of the brick manufacturers. Meantime, if they sit still and make no effort to extend their market through this channel it is a foregone conclusion that the persistent hammering for lumber by such organizations as the Southern Pine Association will result in the leaving out of many brick and other clay products that ought to be included in the yard stock and sold regularly by such retailers.

LUMBER WORLD REVIEW



RED LIGHTS
NO. 3

Stop-Look-Listen!

¶ Consider the following, recently printed in the "Gulf Coast Lumberman,"—it is an actual daily sales report sent to the head offices of a line yard lumber company:

10	Sacks Cement
10	Sacks Plaster
5	Rolls Roofing Paper
200	Feet Wall Paper
1,500	Bricks
3	Ricks of Wood
40	Bundles of Lath
1	Sack Long Fertilizer
10	Gallons Paint
100	Rods Wire Fencing
50	Galvanized Iron Posts
50	Lbs. Nails
2	Paint Brushes
1	Gallon Gopher-Go
1	Galvanized Iron Garage
1	2x4-8 ft.

Nuf Sed!

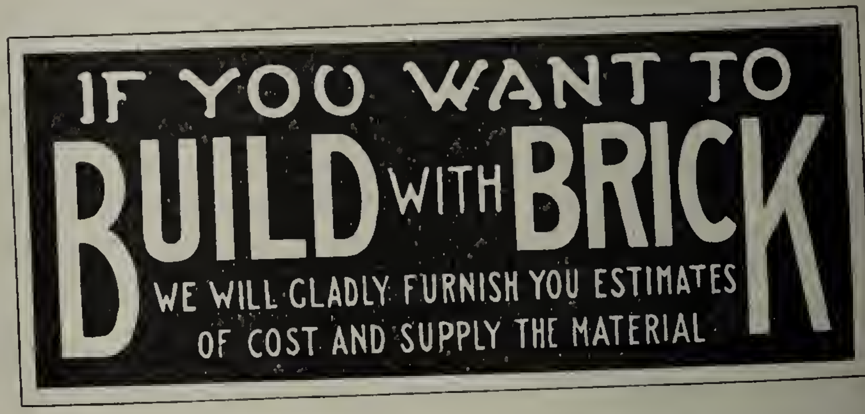
Southern Pine Assoc'n
New Orleans, Louisiana

A NEW BUILD WITH BRICK IDEA.

JUST that simple slogan "Build With Brick" posted up everywhere in the country staring people in the face continually in various forms has had a wonderful effect upon the country and has put brick in the limelight as it has never been before.

We should keep up the good work of Build With Brick posters and of using slogans everywhere that it is practical, and here is a new idea for a different type of poster, a poster to go to retail yardmen and other yards dealing in building material carrying the slogan Build With Brick.

The idea is for each brick manufacturer to get some special signs carrying the Build With Brick slogan for distribution to the retail dealers in the territory covered by him, those who are customers of his and prospective customers. Let the sign differ a little from the regulation Build With Brick sign and read something like as follows:



IF YOU WANT TO
BUILD WITH BRICK
WE WILL GLADLY FURNISH YOU ESTIMATES
OF COST AND SUPPLY THE MATERIAL

Signs of this kind tacked up on the outer wall of the retail yard office or hung on the inside will serve to advertise brick and also call attention to the fact that the retailer is prepared to and willing to furnish prices on brick and estimate the cost of building with brick.

The writer has seen in retailers' offices some signs that suggested this, signs furnished by manufacturers of roofing and other material simply setting forth that the institution handles such and such material. The retailer is glad to hang these signs because they serve as reminders and help get trade. He should be equally glad to hang Build With Brick signs of some such wording as that suggested above because it will help the retailer as well as the brick man. It will remind the customer that the retailer is in a position to furnish some information about brick and supply whatever brick he may need for building purposes.

The majority of retail yards carry clay products in some form and usually in a number of forms. They carry sewer pipe, flue lining, fire brick, drain tile and generally have an agency for face brick and also for common brick.

How much these lines of clay products may develop in the future depends partly on the enterprise of the clay manufacturers in helping boost them. It is only about ten years ago that the cement item, like the clay item, was a small incidental item in the lumber yard and was handled by other merchants as well as dealers in building material. The cement men looked the situation over and concluded there was a chance to develop more and bigger business by proper exploitation. So they sought out the retailers, concentrated their sales through this channel and started in to exploit cement both in a general way themselves and by furnishing literature to the dealers. In ten years they have just about multiplied the quantity of cement used ten times and they are now threatening to make it the leading item in the retail yard instead of a side line.

There is a difference between brick and cement and perhaps the opportunity before the brick trade may not look as promising as those which were before the cement trade ten years ago, but really there is just as much room for development and if the brick manufacturers will push their business through these channels persistently and intelligently they can improve the volume of trade materially.

One of the least expensive and most practical methods suggesting itself to begin pushing clay products to the front more conspicuously in the retail yard is that of our well known and already famous Build With Brick posters and signs. If every brick man would furnish the retailers in his territory with signs as suggested above it would be about the least expensive kind of advertising that could be done and it should pave the way to better business and to bigger things in exploiting brick through the retail yard.

Written for The Clay-Worker.

BRICK NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

The SEASON IS ABOUT to open for active building, although the productive period will be some weeks away yet, for the winter has not yet broken up at this writing, and the weather will not be free from frost danger until after the first of May or later. The general prospect for building was never better. In both cities there are a number of large projects in view or under way, and many more are about to be figured, with the result that there appears to be an exceptional demand for common brick already, which may exhaust the stock on hand before the new season's brick are available.

In addition to this, there are several new factors entering the field which promise to develop a wider demand for brick than ever. Some new concerns have started and they are showing commendable enterprise in urging the use of brick through public advertising, rather than taking the method sometimes followed—to try and undercut someone's established business. Certainly an increased production will mean greater effort to develop business, and this should mean a wider use of brick and less of other materials.

The high price of steel and the constantly advancing prices will tend to check building unless there is some reaction, but in spite of this a number of projects seem to be going ahead right along as before. Increased conservatism seems to be the rule with many, however, to guard against being caught with high priced wares and no market.

The C. H. Klein Brick Company, of Chaska, Minn., has opened an office at 500 Plymouth Building, Minneapolis, in charge of L. G. Rose, heretofore with the Minneapolis Clay Brick Company. Mr. Rose has been with the brick business in Minneapolis for a number of years and is well known to the trade. The Klein yards at Chaska have sold brick in large quantities in the Twin Cities, and in thus opening an office here they are planning to extend their market.

The Colburn-Murray Brick Company, of 630 McKnight Building, Minneapolis, are fitting up the assembly room of the Northwest Building Material Exhibit, fourth floor of the First-National Soo Line Building, with complete panel displays of their different varieties of brick. They will have one of the most attractive displays to be found anywhere. They expect to be in the new quarters April 1.

The Twin City Brick Company has moved its Minneapolis offices and display rooms from 1018 Lumber Exchange to 837 First National Soo Line Building, where they have an exceptionally attractive set of panels of the different kinds of brick which they handle. The new quarters are a great improvement over the old stand.

John H. Donahue, Jr., who has been St. Paul representative of the Belt Line Brick Company, has resigned and becomes associated with the Corning Brick Company, of St. Paul., reorganized as the Corning-Donahue Brick Company, with offices at 613 Ryan Building. A distributing warehouse is being erected in the Midway district, which will be completed shortly. The new company is capitalized at $50,000.

The Duluth Clay Products Company is completing a plant near Tower, Minn., which is expected to be ready for operation with the opening of spring. Machines with a daily capacity of 150,000 brick are being installed and the Crosby drying method will be used. The kilns are of the down draft type. The company will produce common and face brick, fire brick, tile and hollow blocks.

The Minnesota railroad and warehouse commission handed down a decision some time ago, ordering railroads in two different instances to lay sidetracks to brick plants. At Springfield, Minn., the A. C. Ochs plant was ordered furnished with the desired siding, the owner of the plant to do the necessary grading, furnish the right of way and clear the same. The railroad in question contests the right of the commission to order sidetracks to private industries and will fight in the supreme court, although putting in the track and having the loser in court have the cost to pay. A somewhat similar decision was made by the commission in the case of the Range Sand-Lime Brick Company plant at Pengilly, Swan Lake, Minn. The Great Northern Railway tracks are within a few hundred feet of the plant, but the company refused to put in a siding unless the brick company would pay all expenses. The order is to install the siding, the brick company to do the grading and furnish the ties. The Mesaba Railway has had a siding to this plant, but the Great Northern's refusal to give a connection has cut down the company's available field materially.

Estimates have been made that over one thousand carloads of tile were laid on farms in Nicollet county, Minnesota, during the past year. There were 125 farmers who had their land tiled during the summer.

Minneapolis bricklayers recently announced a change of their scale from 70 cents to 75 cents per hour, asking the city council to approve the change, to be effective May 1.

The A. C. Ochs Brick and Tile Company, of Springfield, Minn., has been incorporated, being the continuance of an old established business of the same name. The capital stock is $200,000. The incorporators are A. C. Ochs, Mary Ochs, William A. Ochs, Arthur C. Ochs and Walter M. Ochs, all of Springfield.

The Tate Tile and Silo Company, of Cannon Falls, Minn., was a recent incorporation, with a capital stock of $100,000. E. Tate and H. P. Hansen, of Cannon Falls, and A. G. Chase, of Faribault, Minn., are the incorporators.

The Hutchinson Brick and Tile Company, of Hutchinson, Minn., has filed articles of incorporation, with $200,000 capital stock. M. C. Madsen, W. E. Harrington, W. T. Madsen, H. H. Ames and F. N. Moore, all of Hutchinson, are the incorporators. This is the continuation of an old established business conducted by M. C. Madsen for many years.

A pottery plant is reported to be established at Stanton, N. D., by eastern capital.

The St. Paul city library has been presented with fifty clay tablets with cuniform characters, the inscriptions dating from 500 to 2000 B. C. They were part of the collection secured by a party from the University of Chicago, headed by Dr. Edgar L. Banks.

T. WIN.

The National Road.

Brick Pavements Along its Course from Cumberland, Md., to Jefferson City, Mo., Will Make This Old Historic Trail an Ideal One.

The Brick Pavement Commencing at the Corporation Line, Bridgeport.

DO ALL OF our readers know what the "National Road" means? The time was when every citizen of the country, old and young, knew that it meant a great highway improvement from Cumberland, Maryland, to Jefferson City, Missouri.

It was the one big enterprise fostered and financed by our National Congress; the one great enterprise that was to influence the development of the untouched resources of the country through which the road was routed. It was regarded as a national necessity.

The Wonder Bridge on the Old National Road.

Its former importance and its influence on the present-day population of the country is little realized and may never be restored. A sudden impetus in this direction is almost impossible. The interests of the country have become so diversified that many enterprises of great importance divide the attention of men; a matter, therefore, of great single national importance is less possible today than in the past. In spite ot all this there are in the list but few undertakings which would more greatly benefit the vast majority, in an economic, social and material way, than the improvement to a high standard of a few great thoroughfares throughout the country. The time may come when, as a matter of military preparedness, the expenditure therefor will be worth more than any other object for which an equal amount of money might be expended.

The National Road, through all the development that has taken place, still maintains its relative place as the most logical and important route to be improved. Ohio has well sensed this fact. Improvement in the case of most widely advertised highways has not gone much beyond naming a colored streak across the map; but Ohio, in co-operation with the counties through which the National Road is an actuality, is making a real effort for a high-grade improvement. Belmont county may carry off first honors. The entire route through that country is under contract to be brick paved, sixteen feet in width.

The actual start of this improvement commences at the corporation line of the little town of Bridgeport, that lies in the Ohio valley opposite the city of Wheeling. From this point it follows the course of the Wheeling creek valley, the hillsides of which are dotted by homes evidencing all the comfort and thrift universal with our smaller towns throughout the country. These hills are almost mountains, affording a wonderful variety of scenery, yet lacking the abrupt character of mountainous country; rich in soil, affording an abundant yield of every character of Ohio farm products. They blend with the scenic richness, exerting a delightful influence on the traveler.

This road is certainly destined to witness, when improved, a revivification of the highway traveler akin to but not wholly like those who passed over this road in the '30's.

One remaining landmark to which attaches memories of the stagecoach days is shown on page 440. The water from the well is just as refreshing; the smiles of the ladies on the porch betoken the same welcome, but the place as a whole simply evidences history. Something was there that isn't there now; the whitewash has faded; the gate is gone; much of the old barn has been torn away, but the curb of the new road marks for this place a new epoch. It will be redressed and take on the spirit of the day.

The bridge scene is linked with legends. It was built nearly ninety years ago. Whether the crooks, and the turns, the bumps, the irregular lines were made to harmonize with all surrounding nature, or whether it was shaped to suit the mere whim of the builder, can not be proved. It is a curiosity to say the least. It would scarcely be expected, however, that the fruit of some antique whim would be in keeping with the influences of the last hundred years. It required but little repair to restore this bridge to its original worth. It is sincerely hoped that in the rebuilding of this road the same painstaking care that is evidenced in the building of this bridge will be extended to the road construction. If so, the wear and tear upon this brick road will impart no serious injury for another hundred years. If injury and want of repair comes at all, it will be due to some neglect in construction; some one thing or another that could be more

Engineer Rice Directing the Work.

The Coarse Sand Stone Ready for the Rolling.

easily done than the placing of a single stone in this wonderful bridge.

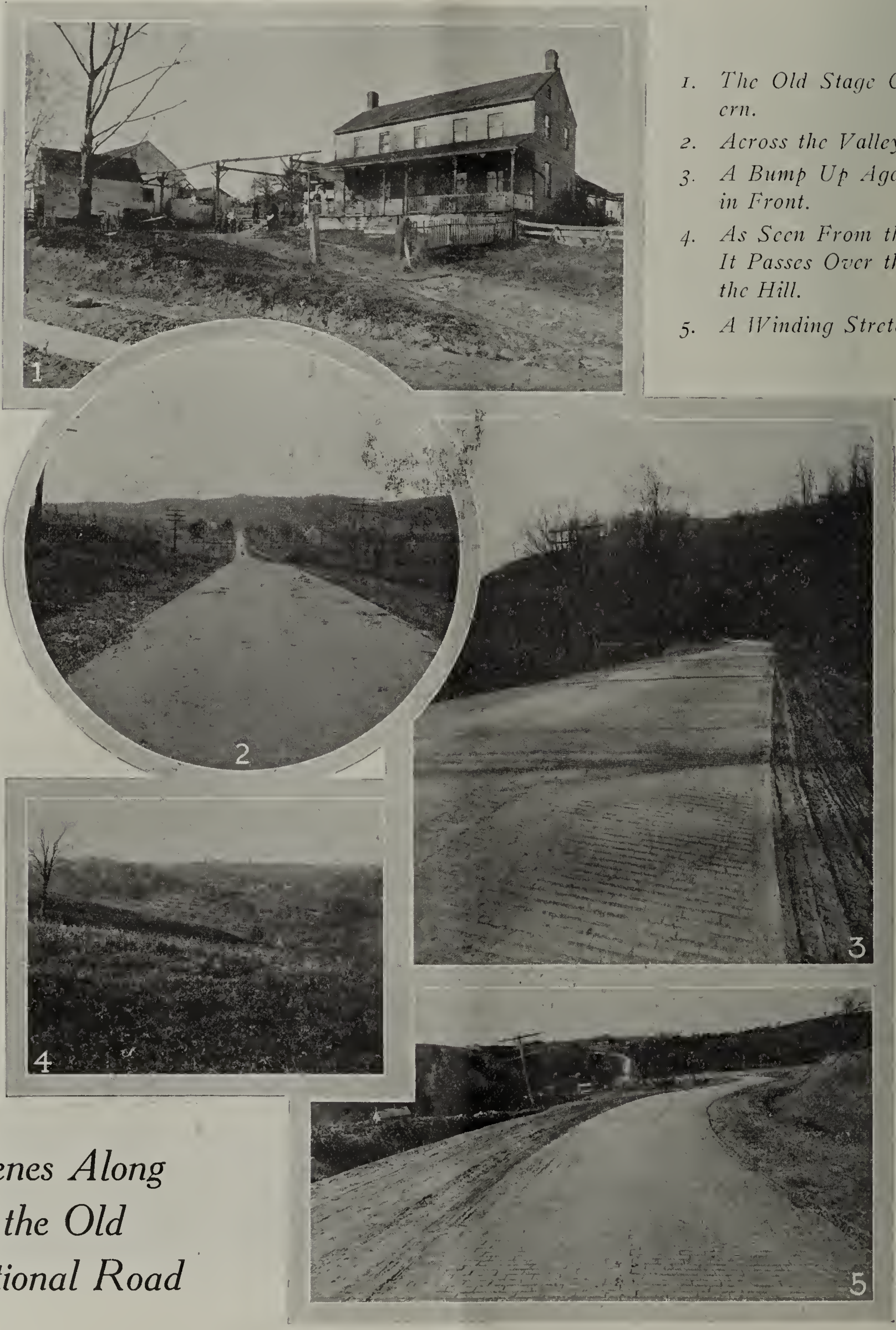
Watchful care, direction, instruction from the grading to the finished surface, will make possible the hope of splendid construction. The engineer was caught in the act. It may seem a little thing to have the subgrade prepared with exact care, but the effort is worth while. This picture shows Henry E. Rice, county surveyor of Belmont county. We sincerely commend his effort to see that details of construction are properly complied with.

A winding stretch ahead—across a valley and a bump up against a hill in front—all different from the picturesqueness just passed, gives a variety of interest unequaled anywhere at home or abroad.

Several short sections are yet uncompleted in this county—the larger pieces awaiting the heavy roller to crush and smooth the broken stone base will be noticed with peculiar interest by most engineers.

Gurnsey, the next county to the west, has contracted for fourteen miles of brick pavement on this road to be fifteen feet wide. Eleven miles yet remain to be contracted for.

Through these two counties an example is set for National



1. *The Old Stage Coach Tavern.*
2. *Across the Valley.*
3. *A Bump Up Against a Hill in Front.*
4. *As Seen From the Road as It Passes Over the Crest of the Hill.*
5. *A Winding Stretch Ahead.*

Scenes Along the Old National Road

Road improvement that should be followed through the balance of the counties in Ohio, Indiana and Illinois. It would be a great regret—waste of money—in fact a calamity if any less durable type of road improvement should be undertaken. If this should unfortunately be done, even in spite of the existing division of authority, wheels within wheels, county against township and township against county, in states looking on without the courage to deal with at least this road as a purely business proposition, some one, perhaps a number of persons who ought to exercise the best of judgment, will be brought to stand before the bar of public opinion and receive a condemnation that will smirch them forever and justly so.

The National Road is a road that should be improved in keeping with its importance, in keeping with its history and especially in keeping with the uses to which it will be subjected for all time to come. It should meet the demands of local and through travel. It should by all means be a road that an army could pass over with an equipment of artillery sufficient to meet the world in battle if need be.—Courtesy of Dependable Highways.

Written for THE CLAY-WORKER.

SEEN IN NEW JERSEY.

PROPERTY OWNERS ON three of the principal streets in Plainfield voted upon the pavement they preferred. The vote was forty-nine in favor of vitrified brick and one against. That is about the proportion almost everywhere when they understand the difference between brick and other types of paving.

The old plant of the Trenton Fire Brick Company has been taken over by the Sneyd Enameled Brick Company, recently incorporated. The price paid, under foreclosure proceedings, was $30,000, and Charles A. Pape and Malcolm Buchanan made the deal. The plant includes a brick building with drying sheds, and a plot 300x600 feet. It is considered well adapted to making enameled brick.

The Mercer Clay Products Company has been incorporated at Trenton to mine and sell clay and manufacture clay products. The capital stock is $105,000, and the incorporators are Charles H. Rue and William A. Hamilton, of Trenton; P. C. Boving, of Philadelphia; L. G. Bachert, of New London, Conn.

The Standard Brick Company has been incorporated at Trenton with a capital stock of $125,000. The incorporators are A. J. Barrall, Syracuse, N. Y.; G. C. Roth, East Orange, and H. S. Smith, Summit.

The Singac Brick Company, Singac, is preparing for an active campaign this season. Last year it did not make as many as it customarily does and as a consequence when certain interests went for brick to fill orders for material which could not be obtained elsewhere the company had none to offer. The sheds are bare of stock now and it will be two months to new burning.

Not much stir yet along the Hackensack. The cold weather and snow lingered so long this spring that operations were delayed somewhat compared with previous years. During the winter Hackensack makers have had numerous calls for brick at high prices, but not all operated to capacity last year and few had anything to offer. Hackensack yards will be furnished up somewhat this spring, and they need it if they are to yield full capacity.

Raritan makers are beginning operations as this is written, principally because of the insistent demand for brick from practically all buyers. Every structural interest is looking for brick and Raritan makers have about sold out their holdings. A few have some in store, but the supply is small and present demand will clear them all out within a short time. Prices at the yards are around $8.00 for common brick and the quantity available at that figure is too small to satisfy the requirements. Making will begin almost at once and the first burnings will be ready for delivery earlier than ordinarily.

The National Fire Proofing Company granted the employes at its Port Murry plant an increase of ten per cent in wages, taking effect April 1. This is the second increase of ten per cent, the former taking effect February 1. The company is having the busiest year in its history and as soon as its $12,000 of new machinery is installed they will double the capacity of the plant. The orders now in hand will keep the plant busy day and night during several months to come.

The Homestead Brick Company, at Homestead, disposed of all its stock during the winter and now is opening the season with bare sheds. Already workmen have begun getting ready for the summer's campaign and are preparing for the most active one the firm has ever had. The campaign is located in a growing section, not far from Jersey City and has steadily increased its sales since it was founded, four or five years ago. Some sales for the new season's delivery have already been made.

Four hundred men employed in the Sayre and Fisher plant at Sayerville went out on strike early in the month for higher wages. The men marched on the plant and drove out every man who had not previously quit. All left before that but the kiln workers, and they were forced out. The strikers received $2.25 a day and asked for $2.75. Beginning April 1, the firm gave them a voluntary advance, but that was not enough to satisfy them. The firm tried to compromise, when they went out, on a twenty-cent increase, but it was refused.

A. L. B.

WHAT OTHERS ARE DOING.

The Southern Cypress Manufacturers' Association, which is made up of a rather limited group of lumbermen in the south exploiting only one kind of wood, reported at its annual meeting the following expenditures:

Advertising	$57,577.88
General expenses	51,279.37

This gives us for a comparatively small association of lumbermen an annual expenditure exceeding $100,000, and the best of it is they express pleasure at having spent this sum, because they feel that it has been an investment that has brought returns instead of a burdensome expense on their business.

The Southern Pine Association, which is a successor to the old Yellow Pine Manufacturers' Association, is another group of southern lumbermen, somewhat larger in both numbers and quantity of production than the cypress manufacturers, has an assessment agreement by which each member pays into the association 25 cents for every thousand feet of lumber sold.

Taking last year's cut as a basis, it is figured this will yield a fund of $300,000, and it is expected to add more to it right along.

This fund raised by the Southern Pine Association is to be used in the exploitation of yellow pine for the purposes to which it is best adapted, which will include research work to determine its qualifications for certain uses, the compiling of information pertaining to its uses and lecturing before schools on the subject of yellow pine, and to follow out any and all of a number of different plans and ideas, the purpose of which is to increase the quantity consumed and the value of yellow pine in the eyes of the consumer.

Is it impertinent for us to ask in this connection, what the brickmakers of the south are doing to promote the use of Building Brick?

Wood is no longer too cheap for brick to make progress in home building. Get that under your hat and keep it there, for there is a great day a coming in the building brick industry.

THE ANNUAL N. B. M. A. BANQUET.

A Wholesome Feast, Enjoyable Music and Splendid Oratory Full of Wit, Humor and Patriotism, Pleased a Happy Throng.

AN OCCASION long to be remembered, was an expression used by scores of clayworkers in commenting on the annual banquet of the N. B. M. A., held in the banquet hall of the Hotel Statler, Cleveland, on the evening of February 24. It was indeed a memorable event, an unusual treat, with three hours of laughter, mirth, serious thought and patriotic spirit commingled in gratifying proportion. A most pleasing scene greeted the eyes of the banqueters as the throng marched in, to the music of an excellent orchestra. The floral decorations were simple but topped by Old Glory on every hand they were indeed charming. The tables were decorated with jonquils and ferns and at each plate were candy cigars for the ladies and the Build with Brick cigarettes donated by the Detroit Brick Manufacturers' Association for the gentlemen. The audience was about evenly divided between lovely women and their escorts and there was not a dull or drowsy moment from the time the toastmaster called for order till the final word of dismissal. An innovation, a welcome in song rendered by Miss Elsie Hamilton Norton, of Cleveland, was the first hit of the evening (there were many others). An encore was demanded and she sang a parody on "A Little Bit of Heaven" that keyed the audience to a high pitch of enthusiasm. The following menu was served in excellent style:

Hors d'Oeuvres Artistique
Celery Salted Nuts Olives
Chicken Gumbo Royal
Whitefish Saute Meuniere
Cucumber Salad
Filet Mignon Bearnaise
Peas Roasted Potatoes
Combination Salad
Biscut Statler Assorted Cakes
Coffee

Toastmaster Deckman: May we kindly have your attention, that we may proceed with our program.

"There are waves away out on the ocean that never break
on the beach;
There are billows of emotion that find no expression in
speech."

It is not the purpose of the toastmaster on this occasion to take up any of your time. This is to me a new position in life. It has been my pleasure to preside at many gatherings, but this is the first time I have ever had wished on me the duties of toastmaster. I know my qualifications are not such as would entertain you in the ordinary preliminaries of a toastmaster. I am now going to ask the audience to rise while we first sing "America."

(The audience rose and all joined in singing "America.")

Toastmaster Deckman: The first formal toast of the evening is "Men of Clay."

"A potter near his modest cot
Was shaping many an urn and pot;
He took the clay for the earthen things
From beggars' feet and heads of kings."

This toast will be responded to by Rabbi Louis A. Wolsey, of Cleveland, whom it is my pleasure to introduce. (Applause.)

MEN OF CLAY.

BY RABBI LOUIS A. WOLSEY,

(Of the Euclid Avenue Temple, Cleveland, Ohio.)

Mr. Toastmaster, Ladies and Gentlemen:

It gives me much pleasure to address the National Brick Manufacturers' Association, and to stand before their banquet table, and to share the same with one who was my neighbor—one who will probably be the next President of the United States. (Applause.) I might say to you that when I came to Cleveland, I occupied bachelor quarters at the Euclid Apartments, and there I found I had the distinguished companionship of him who then was Congressman Burton. Since then both he and I have moved away from that place, but I wish to say by way of personal justification that I am married since that time. (Laughter.)

I feel as though I am fitted to speak at a banquet of brick manufacturers, because the people whom I have the honor to represent were once engaged in that particular occupation. But I must not mention that particular part of their history, because I have been warned by the man who has been secretary of this Association for the last one hundred years that, should I mention that particular fact and discourse upon it, I should be subjected to a very liberal fine by the National Brick Manufacturers' Association. And I want to say to you that if there is any one poorer than a church mouse it is a synagogue mouse. And I don't propose to enrich the National Brick Manufacturers' Association treasury; for, when I remember the collar buttons that sometimes fall into the minister's collection plate, I know you would not welcome that kind of currency, because the initials of your Association stand also for 'No Bad Money Association." (Laughter and applause.) I also want to say for the benefit of the secretary that that man who enriches himself upon a minister's exchequer is a man somewhat related to that kind of animal the flesh of which is forbidden as food to my people. (Laughter.) That reminds me of a story which may be familiar to some of you. Those of you who have not heard it can perhaps listen to it with interest, and the others can bear with me while I tell it. The story is told of Dr. Hirsch, of Chicago. I am not sure whether it is true of him or not, but they usually attach all sorts of rabbinical stories to Emil G. Hirsch, of Chicago, and he can stand them. They say he boarded a crowded street car in Chicago one day. He managed to get a seat, and when a lady boarded the car and stood in front of him, he arose to give his seat to her. But some unmannerly fellow managed to get the seat before the lady could reach it. Dr. Hirsch was very angry at the young man's lack of good manners, and he glared and glared at him. The young man became very uneasy beneath the stare of the Rabbi, and he finally said: "What is the

Toastmaster Charles J. Deckman.

matter with you? You look like you want to eat me up." And the Rabbi said, "Pardon me, I am a Jew and my religion forbids me." (Laughter.) Your Association is also particularly fitted to postprandial speaking, for as I read my Bible I learn that many, many years ago, the inhabitants of the world used to work in clay and built themselves the Tower of Babel. We learn that that first work in clay resulted in the confusion of tongues; so I presume you brick manufacturers are interested in the cause of babbling ever since that historic day.

The first time I ever saw a brick plant I was reminded that this is after all a religious business. I went out to South Park to see how the brick of my Temple were being made, and the superintendent of the brick kiln took out one of the bricks and permitted me to look in; then I saw how it is that brick manufacturers, along with plumbers and ammunition manufacturers, are interested in religion and in the place heatedly exploited by religion. (Laughter.)

That reminds me of a story that I am sure Senator Burton will relish. After all, they say the difference between the Republican and the Democrat is a difference in climate. If you go up to bleak, cold Maine, you will find they are all Republicans. You go down into New York, and you will find the majority of the inhabitants are Republicans. You go a little farther south, and you will find a great many Democrats; then you go farther south into Virginia, and you will find the Democrats are in the majority over the Republicans. You go still farther south into Texas, and you will find the people there are almost completely Democrats. Now you have but one place farther to go, and there they are all Democrats. (Applause.) I am sure I can tell that story with good grace, because I happen to belong to that party, and it is my business in life to try to keep people away from that place. But it is time I get to my text, which is a very unusual thing for a minister to do. John and James came out of church, and John asked Jim how he liked the sermon. And Jim said, "If the text had smallpox, the minister would never have caught it." (Laughter.)

Hon. Theodore E. Burton, Cleveland, Ohio.

Now it becomes my solemn duty as it will be my brief task to address myself to "Men of Clay." Men are like clay—perishable, breakable and weak. They are like the image which Nebuchadnezzar saw in his dream, an idol with its head made of gold, its arms and breast of silver, its thighs of brass, its legs of iron, its feet of clay and iron. Our heads are in the air dreaming dreams of another world, but our feet are made of clay and tied to earth. That is the character of man, and if you will read the story of the idol of Nebuchadnezzar, you will also read that a stone not fashioned by the hands of man came, as it were, out of the unseen and struck the feet of clay and broke the idol to pieces. It was scattered to the four winds of the heaven and fell as chaff upon the summer threshing floor. These stones that break the men of clay strike their feet first. Oh, how true this is of life. The one weakness there is in humanity is always the point of attack for those who are our enemies. Oh, the world is full of chatterers and gossip mongers who always attack the weakest in man. When they find some fault in us, some falling away from virtue, they proceed to destroy the whole figure of clay and all that is noble in man. We forget that doggerel that has so much truth in it:

"There is so much good in the worst of us,
And so much bad in the best of us,
That it does not behoove any of us
To talk about the rest of us."

We who criticise, who disparage our fellow man, forget that we are made out of clay, prone to appetites and passions, and all of us fall from the high ideals that we formed in our tender and growing youth.

Oh, we ought to remember that this clay houses an immortal soul. Oh, we forget it houses the spirit of God Himself. The immortal soul of man has no limit to its aspirations or ideals. The children of man can reach out to the very empyrean. I believe when we shall go back to the dust into which we are ultimately to be resolved, the question that shall be asked of us will not be how we have failed, not what our vices have been, not what our weaknesses are, but how hard we have tried, what we have done, what have we contributed to the life of man.

In teaching a child, I feel that if I remind him of his badness, and tell him he is falling from grace, that child will earn the name as well as the game. We should remind the child of the strength that is within him, of the great possibilities in his life. So, too, if we emphasize the virtues and graces of the men around us, and see the good in them instead of the evil, I believe mankind would forge farther ahead in their journey towards perfection.

In the story of Elisha and Elijah we find that Elisha asked a double portion of the master's spirit before he should be taken for him, and Elijah answered: "If thou shalt see me when I am taken away, then shall it be so." We are so close to each other that we see each other's faults and we do not see the graces and loveliness in each other's characters; but after death has entered, then idealization sets in, and we see the real worth of the man. Those close to Abraham Lincoln saw only the ungracefulness of his gait and the awkwardness of his speech; they did not see the beauty of his soul, or tenderness of his heart, or the greatness of his mind. It was only after he had been taken way that he achieved the greatness all the world now attributes to him.

A few years ago I saw a picture called "Despised and Rejected of Men." It produced a profound impression upon me. It spoke a wondrous message. It represented the figure of Him whom you worship as the Savior of humanity. This figure was the center of the picture. On one side of the picture was represented every occupation of life, and every man was represented with his face turned away; all of them, the preacher and the teacher, the statesman and the scholar, the man of commerce and the man of industry had his face turned away from Him who represented in the picture the idealism and the exaltation of religion. The only one in the picture who faced the figure was the woman who had fallen, and who had given up her sinful occupation and who had come back to Him whom she believed had power to lift her up again. That woman understood life much better than those others who despised her, who saw no good even in the worst sinner. There is a dignity and uplift in every occupation of life, no matter what it be.

Then do you men who build of clay look for the soul, the virtue, the hope, the vast outreachings of the spirit, of which this clay is but the humble clothing. The fragile in the flesh, the weakness of appetite, the passion of the sense are not the final reality in the ultimate appraisement of human life, but the exalted ambitions, the lofty motives and the generous impulses of the immortal spirit, housed for a while by this form of clay. (Loud applause.)

Toastmaster Deckman: The next toast is "The Nation."

"My country, 'tis of thee,
Sweet land of liberty."

If this toast and sentiment were to be responded to with the time it deserves, I fear the speaker who is to respond to it would exceed the limit of his famous speech in the Senate, when he talked more than twenty-four consecutive hours and at the same time saved to the nation thirty-three million dollars. It is with very great pleasure that I have the honor of introducing to you the Honorable Theodore E. Burton, of Ohio. (Loud applause.)

THE NATION.

"My country 'tis of thee,
Sweet land of liberty."

BY HON. THEODORE E. BURTON, CLEVELAND, OHIO.

Mr. Toastmaster, Ladies and Gentlemen:

I am exceedingly obliged to you for this very friendly reception. After what has been said by the toastmaster, some of you may be apprehensive that if you have any program on for the remaining hours of the night, it may be abridged or prevented by the remarks which I am to make. Last summer I went to a city, undecided about the subject on which I was to speak. The committee or arrangements met me and I asked: "What shall I talk about?" "Oh," said one of them, "give us an illustration of an old-time filibuster in the Senate." The rest immediately raised their hands in protest, as if to say, "Nothing of the kind; that is not our sentiment." But I do really feel as though possibly a few words of extenuation of my course might be uttered profitably in this friendly audience. Accordingly I will tell of the inside history of that occasion which has been mentioned.

One Friday in September, 1914, the committee which had in charge and which had recommended a rivers and harbors bill met at 10:00 o'clock in the morning. Every member of the committee agreed that the measure was faulty and wasteful; that it should be diminished by $20,000,000 at least; but two members, very much interested in appropriations for their locality, were absent, and it was suggested that we meet the following morning, Saturday, at 10:00 o'clock, when every one anticipated that action would be taken to reform the bill. We were in a session of the Senate which had commenced at 11:00 o'clock, and at 5:00 o'clock one of the senators extremely interested in the measure came to me and said: "I find it will be impossible to modify that bill. The meeting called for tomorrow at 10:00 o'clock has been annulled, and I want to say to you further that we are going to hold an all-night session tonight and pass it." I said to him, "I don't believe you will do it." At fifteen minutes of 6:00 o'clock the talking began. It was in my mind to prevent the passage of that bill. Familiarity with the subject was required, physical strength and lung power which very naturally was aroused by the circumstances. The tiresome period was about the third hour; about midnight I became accustomed to talking, and after six hours it was possible to throw a harpoon into them by asking, "What are you intending to do? Are you going to make a night of it?" And they knew the talking would continue just as long as they would stay. The result was not quite twenty-four hours, Mr. Chairman, but twelve hours and twenty-five minutes. After a respite of two or three hours, I began again to go on indefinitely. They had thought they would hold a session through Sunday. There was a report published in the newspapers that my good friend, Senator Borah, sent me a message, "Hold the fort for I am coming." He did not send that message, but did wire that he would come Sunday morning, if it should be necessary, but before evening the men behind the bill gave way, the support collapsed and the measure was killed. Now if that was filibustering, make the most of it. I think it was justified under all the circumstances of the case. (Applause.)

I congratulate you, my friends, on having heard the eloquent address of Rabbi Wolsey, with its splendid ideals. He has referred to the rather different course we have pursued since we lived together out on 116th street. I am reminded of a motto which reads, "To one the cross, to the other the crown." (Laughter.) I do not know exactly to which of us these two respective decorations, or whatever you may call them, belong.

I congratulate you gentlemen upon your occupation. The manufacture of clay products was one of the first industries in the history of the world. Clay was used in the very earliest years, because of its plastic quality when moist and its hardness when dry or subjected to heat. Before many generations of men had lived on the earth the industry in which you are engaged was being conducted; in ancient Chaldea, in Egypt, later in Greece, in Etruria and in Rome. There was an idea that prevailed in the olden time that the method for the treatment of clay came down from heaven as a revelation. While that tradition was accepted the fact is that its use in construction started independently in many lands. As the products of clay have been developed in different portions of the earth, their utilization for the conveniences of life, the luxuries, and for artistic objects has increased and no doubt in the future the increase will be still greater. Our lumber will not be abundant; the iron ore in the mines may be so exhausted that other ores may have to be employed. But clay will continue, there is an abundance of it, and it will be used more and more in adding to the facilities of modern life. Brick is required for paving our streets and our roads. In these days of invention and demand for more perfect facilities, it is demanded that we have streets well adapted for the movement of man and beast, for automobiles and vehicles. It will not be long before our whole state and the states of this country will be provided with roads of the best quality. Paving brick and other materials which you can furnish will supply a very large share, perhaps the largest share of that which is needed and it gives me pleasure to congratulate you upon the prospect. You are engaged in a business which not only means abundant occupation and prosperity in the future but what more appeals to me, one which will add to the convenience of modern life and the growth of all these things which make for civilization here and elsewhere.

The future is a word of very unusual significance now. The orderly progress which existed until that fateful day of August, 1914, cannot be stopped even by this fearful cataclysm, this terrible devastating war. It may hold back the progress of civilization for a time, but we are going ahead. The discoveries of science, the demands of modern life, all are making life something altogether different from what it was. We are remodeling the earth, and in any great work of construction, men are not merely benefiting themselves, but they are benefiting the race.

I have been asked to say something on "The Nation". Do you realize the degree in which all this tide of prosperity and luxury and happiness depends upon the nation. It is like a protecting shield that is held over all of us. We would not so rapidly advance under a government less liberal, one that affords less protection. We do not realize how much we owe to our country, or how great our responsibilities are, and if there is any one cause in which I have tried to be an apostle it has been in attempting to quicken the interest of the people of this my own State and of the country outside so far as I have been able to reach, in the affairs that pertain to the public. I am getting to be a veteran in public life, almost thirty years now, and I regret to say—though I think there has been somewhat of a revival in the last few years—it is harder to awaken an interest in public life than in the Eighties. There is a reason for that in the abounding opportunities of American life. Every school boy is entertained by the story of how someone in humble surroundings became rich and successful, a multi-millionaire. The poor of one generation become the rich of the next, and the rich may become poor or decadent. The wheel of fortune is constantly turning over and in the mad competition for success it is natural that subjects of supreme importance should be neglected.

Richard H. Lee, Cleveland, Ohio.

I will not admit for a minute that the spirit of patriotism among our people is less than elsewhere or the disposition to be honest among business men. But the impulses that make for co-operation are hindered by absorption in business. Now, I do not deprecate ambition, I do not ask people to abate one iota from their industry, in their respective lines of endeavor, but I do ask of all you to give greater attention to matters of the city and the State and the Nation because we cannot maintain our remarkable advantages unless these matters which belong to the general welfare receive the same thought and attention as your own welfare.

It is wonderful when you think of the success of many of the people of this country all due again, I say, to the splendid opportunities of American life. I have known immigrants who have been in this country not twenty-five years, struggling from the country of their birth with barely enough to pass Ellis Island, able to accumulate enough to build a castle surpassing that of the overlord in their native land, and bedeck their wives and daughters with jewels and fine apparel surpassing the coronation robes of a queen.

How wonderful the success of our business men and manufacturers. In the admiration of the splendid achievements of industry and commerce, let us see to it that we do not neglect the nation. Just now there is an especial reason for us to pause and reflect in view of the transcendent blessings we enjoy in this country of ours. Never was a nation so blessed. (Applause) Shall we let this great crisis in the world's history pass without a new baptism of patriotism, a new interest in humanity. As I stated one time last summer from this very place, patriotism does not consist merely in responding to the call to arms, in putting on a uniform and learning to shoot straight. It means becoming a greater factor in the civic management of the affairs of the body politic. I was very much pleased at what Rabbi Wolsey said about gossip mongers attacking human weaknesses in that he gave an index to conditions very important in public life. No man can be an official or candidate for office without going through a gauntlet of misrepresentation or detraction and perhaps of falsehood. These are sometimes resorted to because they are a successful appeal to the yellow streak that exists in some members of the electorate, but more because he who uses the tongue of slander recognizes that the people are not informed and often accept the falsehoods that are told. A lie will go on the wings of lightening while the truth will go at a snail's pace. That is the truth about it and so I say to you weigh carefully the arguments against and for the men who are candidates for office. Weigh them carefully and condemn them if they are wrong, uphold them if they are right. Thus will the nation be upbuilt, thus will we have good government, thus will we have good officials. It all rests with you. It rests with the women as well as with the men. That does not depend upon your having the right of suffrage. My predilection is rather in favor of your having it, but with your kindly sympathies, your high ideals, it is for you to exercise influence and judgment in favor of higher standards among men in official life, of justice and fairness tempered with mercy in the legislation and in all the management of the state. So don't for a minute think you are unnecessary in this government of ours for you are equally important with the men.

Wm. D. Gates, Chicago, Ill.

I remember one time being in England when Mr. Gladstone was ill. There were important matters being considered and the whole country was disturbed because he was confined to his bed. It was said of Queen Victoria (most incorrectly) that she exercised as much control in the government of England as the Goddess of Liberty in the United States, but she sent a motherly message to Mr. Gladstone to take good care of himself, not to worry, that surely he would soon recover and that the sympathy and good will of all England were with him; then the tempest, as it were, was stilled because of that woman's kindly message sent to the great Prime Minister. It is not necessary to occupy Queen Victoria's place to have an equally wholesome and salutary influence.

Just a word I want to say about the two men born in this month—Washington and Lincoln. We can never impress upon the people too strongly the importance of their work in the upbuilding of this nation. It is wonderful that two men of such widely different characters should occupy an equal place in the history of our country. Washington was an aristocrat, but he believed in equal liberty and justice for all down to the very humblest. There were many things that showed he had the manners of one who separated himself from the masses of the people. They did not have the hand-shaking receptions in that day. The Chief Magistrate stood in the center of the room and bowed politely as the multitude went by. When there were dinners there was not quite the comradeship there is now. The gentlemen and ladies rose and said, "Health, sir", "Health, Madam." When the dinner was finished they did not go into the smoking-room, they left more promptly, after eating. I think Washington would have been very different today, but he laid the foundation for the most helpful policies of this country and for a nation—a nation that begins with a big N rather than a little n—a united country rather than states loosely bound together. The payment of state debts and measures of that nature were all with a view to a united country. There were to be no entangling alliances and when the French ambassador tried to embroil us in a quarrel Washington gave him his dismissal very quickly, although there was a powerful party which favored it. He believed in good will toward all nations, good faith, and last of all, and that is pertinent at this time, he believed in national preparednes for all emergencies. Not for a moment that I believe in being the aggressor or being extravagant or foolish, but new conditions such as those of the present situation mean new duties and in fact new policies.

Over against him was that other great American born this month, Abraham Lincoln. What a contrast between him and Washington. Born in a log cabin, coming out of the West, over the prairies into the great throbbing world, rising up from the most lowly surroundings to the greatest executive position in the world, moving on through martyrdom to everlasting glory. Unlike the great first president, he had the arts of that man so much decried, the politician, who knew how to adopt his measures to the time, he had the marvelous instinct of knowing what the people were thinking about. His heart beat in unison with the humblest and the proudest alike. He has been compared to a great flowing stream, a mighty river which in its course meets many rocks and obstacles, but when it comes to an obstacle the waters break apart and move on in undiminished volume to the sea. We have his example of love of country, how he himself died, giving his life at last to the great cause. Are we in this day going to lose our patriotism? I think sometimes we are prone to look upon patriotism as a sort of vague and purposeless sentimentalism. We sing the "Star Spangled Banner" and "My Country 'Tis of Thee" and straightway go away and forget what kind of men and women we are. Nevertheless I am glad to believe that if occasion arises, every heart will be ready to make all needed sacrifices for our country, that the same spirit which in foreign lands prompts the young man to be ready to die for his King, prompts our young man to be ready to live for the Republic and to die for it if such a sacrifice be necessary. We look forward with an enlarged vision today, our country is increasing in all that makes for greatness. Population, production, wealth, everything is assuming a new phase. Isn't it time for more idealism, for patriotism. When more than half the world is directly involved in the greatest struggle in the world's history, may we not as citizens of America with new resolves, enter upon this 1916 and the years that follow with a new desire to build up our country and aid humanity and perform the new duties of this time in a manner worthy of the men and women of this country. (Prolonged applause.)

Toastmaster Deckman: The next toast, "Ancients and Moderns," will be responded to by one of our own well loved members, W. D. Gates, of Chicago, ex-president of the American Ceramic Society. (Applause.) Underneath the subject I find the following sentiment, "This Association (the A. C. S.) Is Not Responsible for the Sentiments Expressed by Its Members." (Laughter.)

MODERNS AND ANCIENTS

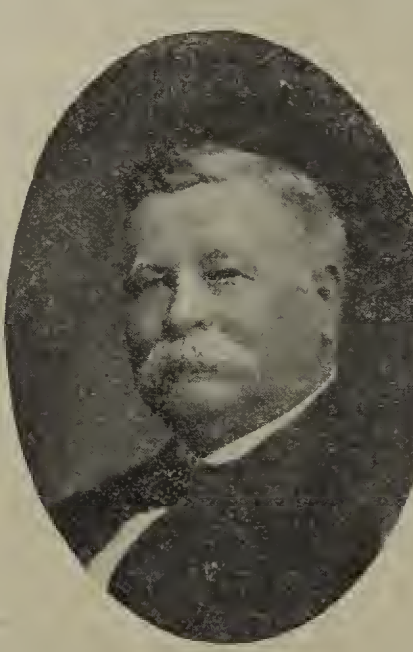
BY W. D. GATES, CHICAGO.

Mr. Toastmaster, Ladies and Gentlemen:

Senator Burton, you have entirely unwittingly, placed me in a very embarrassing position. We have as you don't know, but as we know, some very good long distance talkers in our own organization, and when the president introduced you with a twenty-four hour record, I said, "Its all up as to me" and I proceeded to get my head so full of the ideas you propounded that they have chased away any weaker ideas I may have had to hand out over this table. I want to call your attention again, lest you do not take it in to the little gems of thought put on the program beneath each Toast—any little sentiment that will help a man along and this is what my Association has given me. "This Association as an Organization is not Responsible for the Sentiments Expressed by its Members." (Laughter) I tell you we have an unusual bunch in our organization. When they saw me sit through the sessions of the American Ceramic Society convention, going in there at nine o'clock in the morning, listening to the papers and discussion until twelve-thirty, meeting again at one-thirty and then going on again until somebody had to stop to eat, and sometimes going on again until almost mid-night and they saw me sitting there through those sessions and saw me not open the orifice in my face, even once, and then they sent me over here to talk and then took this occasion to state that they were not responsible for my utterances. (Laughter.)

Montgomery and Stone, in the play of Chin Chin, one says to the other, "Do you dance this newest dance, the Wilson"? And the other fellow said, "No, how do you dance it"? The gentleman said, "Oh, its easy, you take two steps forward, and two steps back, hesitate and then side step." (Laughter.) I don't know whether the Ceramic Society ever heard of Montgomery and Stone or not, but that's what they did. They side stepped coming here to speak. Secretary Randall said they wanted somebody to come over here to lend dignity to the occasion and talk about five minutes, so the president took the next train home and the other ex-presidents made excuses and they recognized my position as sitting through all those sessions without opening my mouth and they gave me this subject of Ancients and Moderns. It's rather embarrassing.

Of course to the older members having come here to this our thirtieth anniversary it carries them back to the years when we first gathered. I want to say that young as I was at that time—I can't remember very much about it, it was almost criminal for my parents to let me away from home at that tender age, (Laughter) but there were gathered there on that occasion a lot of good men. It is wonderful to come to these gatherings and think of the ones who are gone, and to see that so many of those who are here and have served so long, have pushed their way up through the tops of their heads. Looking back at the questions we discussed then, you would hardly realize that that was only thirty years ago. I think the first burning of ware with oil was about that time. It was done at Pullman, Ill. It was done by mixing the oil with the clay. It was followed some time later by one of our Illinois men who corresponded with a brother down in Indiana, back in the woods, in the oil well region and the brother wrote that it would not work. The Illinois man went down to see why; the brother said, "I tried it, and it does not work at all. I took a wagon and put on four or five barrels and went down to the tank and filled them then I started my fires and took a bucket and threw the oil in and it didn't work at all". (Laughter.) Many, many of the expedients tried in those days, were of a very peculiar character. Some of the discussions were as to whether we could make a dry press brick anywhere but in St. Louis. Another question in those days, where in Chicago we were making all the brick by hand, as to whether machines could ever supplant that method, and now today we are taking a machine that originally made 30,000 brick in ten hours and now they are making 300,000 in eight hours. Of course in that first convention, we all absorbed all the information we could. Of course we knew we could never have another convention like that, because we had exhausted all the questions there were to be discussed. But one after another has followed and you are all enthusiastic and you are all working with the spirit of the men of the earlier days. You do not know what failure means. You are all devoted to your work, making a better article, more of them and more beautiful, forgetting the financial end incidentally, and only on rare occasions having enough of the necessary to come here.



Geo. O. Berry, Columbus, Ga.

I think about twelve years after that first convention, there came another event in the history of the N. B. M. A. and the forming of the American Ceramic Society, the one for which I speak tonight, so far as I am willing to stand for it. That little handful of men, about a dozen, started in on the scientific questions. I am proud to say I am a charter member in both of these organizations although I crawled in under the canvass as it were. I sat in the American Ceramic Society with these young men that I have seen come to the front, having attended the schools established by Prof. Orton and others, and become so scientific that as I sat there all the information was going over my head, and all I could do was to reach up and grab a little off as it went by. They are getting so scientific that they are going over our heads, while you in your work are becoming more and more scientific, and all these men are wanting to help you and the results of that are simply beyond anything that we can predict in the future of this country. When we can look and see men come up as we have seen Prof. Orton, and I envy Prof. Orton and the work his place in history in what he has been doing in the upbuilding of our art to a proud position in the world's esteem. He has taken and educated men and they have gone out and educated other men and how far it will reach no one can tell. No one can say what the future will owe to such men as Orton and Bleininger. In Illinois we have lots of clay, no one knows how much clay we have in Illinois. We have established a school there and it was my privilege to go down and assist at the laying of the corner stone of the new building that is being established for clayworking, not to make clay but to make men who will show others how to make clay ware, that will make the United States of America the most renowned center of the universe.

Now the clay you have is an old article, thousands and thousands of years old. I was lucky enough to get one of those very, very old Babylonian tablets which I have been after for a long time. It happened that a professor who has been over to Egypt making historical research brought a number of them back with him. It was my good fortune to spend five dollars—not of my profits, but of my fast disappearing capital, for one of these little tablets, it dates from 2300 B. C. A little bit of clay four thousand years old, and there is inscribed on it a receipt for a man who took some animals to the Temple and left them there for a sacrifice and got this receipt. It reminds me of a little story which is just as old probably as this tablet and possibly was inscribed on the next one, of the man who was fined by a Justice of Peace, who paid his fine and said, "I want a receipt" and the Justice said, "Go on about your business. It shows here that your fine is paid." But the man said, "I want my receipt, so that when I go up before St. Peter and he says, 'Did you pay that fine in that little old justice court?' and I says 'Yes,' and he says, 'Where is that receipt?' Then I'd have to hunt all over hell for Your Honor." (Laughter). That went pretty good for an old one didn't it. I think this old fellow understood this all right for because most of these tablets are on unburned clay, but this fellow took the precaution to have it burned so that it would stand the climate where he was going. (Laughter). This little piece of clay, isn't any older than the clay you are handling today. But, it has added to it the human touch, and whenever clay has had the human touch, wherever there has been a mixture of clay and brains, the result has been marvelous. There is no article more despised than clay, especially when you walk in it. In this case it has had the human touch. I am going to try and have my thirty-day paper put in this shape. Perhaps four thousand years from now it will be worth a high price, but it won't be worth anything in the meantime. (Laughter). The most treasured vase has been handed down thousands of years, absolutely protected and safe by its beauty, and I say you gentlemen, you are creating, you are taking a despised article and by your individuality and enthusiasm you are making it beautiful and lasting and you are making something to show future generations that you were here for some purpose. (Applause).

Toastmaster Deckman: The next toast is "Affiliation," to be responded to by Richard H. Lee, of Cleveland—"A Long Pull, a Strong Pull, and a Pull All Together." It is my pleasure to introduce R. H. Lee, president of the largest automobile club in the world. (Applause.)

AFFILIATION.

"A long pull, a strong pull, and a pull all together."

R. H. LEE, CLEVELAND, OHIO.

Mr. Toastmaster, Ladies and Gentlemen:

I had become so interested in the music I have really forgotten what I was going to say. It reminds me of the only time I ever tried to take my wife with me to hear me speak, and when we got home I said, 'How did you like my speech?" and she said, "Wasn't the music fine?" I am wandering somewhat from my subject, Mr. Toastmaster, but Rabbi Wolsey tried to do it; I think the last speaker wandered somewhat from his subject at one time. When a man can talk to a lot of brick manufacturers about the human touch, I sometimes wonder if he is not wandering from his subject. (Laughter.)

The text that has been assigned to me, like that assigned to the other speakers, was not of my own chosing. In fact, I was invited to come to this banquet some time ago, and the night before last I was notified of this particular subject. However, this is very close to my heart. Aside from making a living the thing that comes next in my affections is an automobile organization and its various affiliations. As you were talking, Senator Burton I just wondered where this great and grand nation of ours might be now if it had not been for the affiliation of the original thirteen states in the Union. The fact occurred to me which one of these states could have stood alone, which one could have conducted that wonderful battle for freedom!

Take the nations at war over in Europe, and which one without her ally, which one without its affiliations, would dare to enter into combat over there.

In my own organization, the Automobile Club, the largest one in the world, composed of—well, the last time I looked at the roster it was something over 6,300, and I do not know how many were taken in today—we have one hundred and sixty-five lady members. To my mind the automobile organizations of the country furnish the greatest example of the power of affiliation we could possible wish for, in their fight for better roads and their fight for better laws. These organizations are taking up their individual work; the local club taking care of the local situation, taking care of the city streets and the laws before the councils and before the county boards; the state organization, with which the city and the local club is affiliated, taking care of all matters that cross the county lines, and the national body taking care of all these matters that cross the state line. These affiliations have made it possible for us to make the wonderful progress that we are making today. The thought I am making is simply that it is a question of bringing everything to a central focus.

Another thought that comes to my mind is the other campaign we are conducting—that the American Automobile Association is conducting against co-operating fraudulent schemes. Let me refer to one type of fraud that we unearthed, and it took a national affiliation to unearth it. Down near the Statler Hotel there is a Ford gasoline filling station. For a fee of $10.00, paid in advance, they say you can purchase your gasoline for the entire year at actual cost. No man who owns anything other than a Ford is eligible to membership. A Ford going through the year would run about 6,000 miles a year. If going well it will make twenty miles on a gallon of gasoline. At that rate, it would consume three hundred gallons of gasoline, and it is assumed that using that amount of gasoline the members would save $6.00 in one year, and they pay $10.00 to save $6.00. (Laughter.)

I am wondering what would be the position of Henry Ford if he had the same sort of an affiliation behind him. I don't know whether you stand for peace. I am sure some of you do. You may stand for war. I am sure some of you do. We may differ on that proposition, but, Senator Burton, when the time comes we will all take our stand beside the man who said, "My country, may she always be right, but right or wrong, my country." (Applause.) It is want of affiliation that draws a man to the side of peace, it is want of proper affiliation that draws a man over on the side of war, and proper affiliation that will draw man over in the middle where I am sure you all are. Rabbi Wolsey left his text and I do not see why I should not.

I just made a trip down through Oklahoma, Texas and Louisiana, looking over the good roads down there. A stranger asked us if we were down there to get better roads. As I told you the other evening I don't say good roads, I say better roads, because we hope to make them all better roads. We have traced the brick back to quite an early stage, Rabbi Wolsey traced it back pretty well, and Senator Burton pushed it still farther back, and I have no doubt but that bitulithic will go back to the cooling period. (Laughter.) I will tell you the thing that impressed me most down there. Strange as it may seem it was a fact that every man that I met, who was interested in better roads, took me into his home and introduced me to his family, and as I looked into the faces of all those ladies I wondered what this all means. Why are we talking better roads? It is all for the home. It is all for the women. That is what it is for, and my mind goes back to Riley's little poem.

I crave, dear Lord,
No boundless hoard
Of gold and gear,
Nor jewels fine,
Nor lands, nor kine,
Nor treasure-heaps of anything—
Let but a little hut be mine,
Where at the hearthstone I may hear
The cricket sing,
And have the shine
Of one glad woman's eyes to make,
For my poor sake,
Our simple home a place divine—
Just the wee cot—the cricket's chirr—
Love, and the smiling face of her.

I pray not for
Great riches, nor
For vast estates, and castle-halls—
Give me to hear the bare footfalls
Of children o'er
An oaken floor,
New-rinsed with sunshine, or bespread
With but the tiny coverlet
And pillow for the baby's head;
And, pray Thou, may
The door stand open and the day
Send ever in a gentle breeze,
With fragrance from the locust-trees,
And drowsy moan of doves, and blur
Of robin-chirps, and drone of bees,
With afterhushes of the stir
Of intermingling sounds and then
The good-wife and the smile of her
Filling the silences again—
The cricket's call,
And the wee cot,
Dear Lord of all,
Deny me not!

These are the sentiments which come back to me as I look into your faces and I am sure you will all agree with the last stanza of that dear poem.

I pray not that
Men tremble at
My power of place
And lordly sway—
I only pray for simple grace
To look my neighbor in the face
Full honestly from day to day—
Yield me his horny palm to hold,
And I'll not pray
For gold—
The tanned face, garlanded with mirth,
It hath the kingliest smile on earth—
The swart brow, diamonded with sweat,
Hath never need of coronet.
And so I reach,
Dear Lord, to Thee,
And do beseech
Thou givest me
The wee cot, and the cricket's chirr,
Love, and the glad sweet face of her!

These are the things toward which we are aiming, after all, and the only affiliation which is really worth anything to any man, Rabbi Wolsey, is the affiliation of which you spoke. I thank you. (Loud applause.)

Gordon C. Keith, Toronto, Ont.

Toastmaster Deckman: The spirit of song seems to largely dominate our program and to be highly appreciated by the audience. We will therefore give you another treat, a song, "The Road to Happiness," by Elsie Hamilton Norton.

Toastmaster Deckman: The next toast is "The Tie That Binds," with the sentiment, "A little touch of nature makes the whole world akin." This will be responded to by Mr. Gordon C. Keith, of Toronto, Ont. (Applause.)

THE TIE THAT BINDS.

GORDON C. KEITH, TORONTO, ONT., CANADA.

Mr. Toastmaster, Ladies and Gentlemen:

When I came into the City of Cleveland the first of this week I saw all the streets and buildings decorated in honor of a great event. I recall from my history that 184 years ago there was born in the British colony of Virginia, George Washington, a British subject whom history now lauds as "the father of his country". Canadians can celebrate with the people of the United States the anniversary of this great man just as we can both celebrate the winning of the battle of Waterloo a hundred years ago, where liberty was obtained for the whole world. George Washington stood for the ideals of freedom, democracy, justice, humanity and liberty, and we must unite in promulgating and upholding those principles, for should tyranny reign, the name of Washington will become a memory. These two great self-governing countries of

North America with four thousand miles of common undefended boundary, who have been at peace for 101 years, who have the same language and who have the same tune to their National Anthem should stand shoulder to shoulder to maintain the principles of liberty, freedom and democracy won for us by our forefathers, and for which the name of George Washington stands.

In his President's address Mr. Mayer said that brick manufacturers must be loyal to their country. If you are loyal to your country you will be loyal to your business, for on the success of your business depends the commercial success of your country. You can best boost your business through such a big organization as the N. B. M. A. which should be supported by the manufacturers of red brick, white brick, buff brick, wire cut, pressed brick, soft mud, stiff mud, paving brick, fire brick, hollow brick, big brick and little brick, and any other brick there may be on the market. United the brick manufacturers can accomplish anything they desire.

Did you ever see two locomotives pulling at opposite ends of a train? They did not get very far, but pulling together in the same direction, they can pull the train through the biggest snowdrift of business depression.

Gentlemen all it needs is a long pull, a strong pull and a pull together. Let all unite in the N. B. M. A. and boost your own business.

The place to begin to boost is with the children. Frequently I read to my two little kiddies a story from one of their story books, of which they are very fond, the story of three little pigs who ran away from their mother to build houses for themselves.

The first little pig met a man with a load of straw and he begged enough to build himself a house. The wolf came and blew down the house and ate the little pig. The second little pig met a man with a load of lumber and he begged enough to build a house. And the wolf came. He could not blow it down but he burned it down and got the little pig. The third little pig met a man with a load of brick and begged enough to build himself a house. And the wolf came and could not blow or burn it down but was finally destroyed himself by falling down the chimney into a pot of boiling water. This is an interesting story with a truth which ties the buyers of tomorrow to the cause of brick.

Charles A. Leedy, Youngstown, Ohio.

But I am reminded by the presence of so many Canadians here and by the orchestra playing the sweet strains of "The Maple Leaf Forever" that

I came over here to the N. B. M. A.,
To the City of Cleveland in the U. S. A.,
Bringing you greetings from across the line,
From all of our boys, including mine.

Each year after your annual meeting
I have heard remarks which will bear repeating.
The boys told of the papers and the many good times
So to come this year I saved my pennies and dimes.

I wanted to see if it all was true,
And this is what I want to say to you:
Though I questioned the boys till they said I was bold,
Yet not even then was the half truth told.

We've been dined and wined and entertained;
We've been up all night till the old moon waned,
For we didn't want to miss any of the fun
Which began at night when the day's work was done.

We've talked of shale and of clay and of brick
At each of the meetings till my head felt thick,
But in the evening I was able to take in all the shows
And eat chicken suppers after sitting in the bald-headed rows.

But I knew for this enjoyment I'd have to pay:
There's a "nigger in the fence" I find to-day;
You call on me to-night a speech to give,
But I couldn't give a speech now as sure as I live.

With this swell banquet I'm crammed to the top,
And there's no room left for table talk:
But to my U. S. Cousins, to all of you girls and boys
I wish you good health and all life's joys. (Applause).

Toastmaster Deckman: The last toast of the evening, "Jibes and Jabs."

"For jokes are little bricks, I guess,
That pave the road to happiness."

This sentiment will be responded to by Charles A. Leedy, of Youngstown, Ohio.

JIBES AND JABS

BY CHARLES A. LEEDY,

(Of the *Youngstown Telegram.*)

"Jibes and Jabs," as most of you know, is the title of a column of newspaper humor which I conduct daily in the Youngstown Daily Telegram, and it is about newspaper humor in general that I intend to speak.

Newspaper humor differs from the more permanent form of humor to be found in books chiefly in the manner of production. While the book may represent months and even years of painstaking effort, the humor of the press is evolved at the rate of a column a day, six or seven days a week, week in and week out, year after year. It is not surprising, then, that out of all this mass of material, some things stick out prominently enough, and are bright and clever enough, to attract the attention of the exchange editors, who reprint them in their papers.

It is astonishing how some of these little gems travel. A joke that was recently printed in our paper was sent to me not long ago by a friend who clipped it from the Paris edition of the New York Herald. Perhaps some of you will recognize it.

Casey came up to Clancey and inquired:

"What are ye laughin' at?"

"Corrigan just wanted to bet me tin dollars he could shoot a peanut off me head."

"Well, where's the joke?"

"I took him up because I know he'll miss it."

I had the distinction, if not the honor, of originating one of the first aviation jokes to become current.

An aviator was taking his wife up with him in an aeroplane for the first time when the wife looked over the edge of the machine, grabbed at one of her husband's arms and exclaimed:

We'll have to go back down again, I dropped one of the pearl buttons off my coat. There it is, I can see it glistening on the ground.

The husband looked over the edge and replied:

"Aw, keep your seat, That's Lake Erie!"

Here's another one from my column:

In a shoe store the other day a clerk was trying to sell a man a pair of shoes which the man didn't like.

"They hurt my feet," he protested.

"But they are the kind everybody is wearing this season," the clerk insisted.

The customer retorted, "that may all be, but I am still wearing my last season's feet."

Another difference between newspaper humor and book humor is the conditions under which each is written. The book humorist may write when he pleases and rest when he pleases, but the column conductor must grind out his bit every day, no matter whether he feels like it or not. Can you imagine how it would feel to try to write a love poem while suffering with the grippe? Then you know how Walt Mason must have felt when he wrote:

THE SICK MINSTREL

I cannot sing today, my dear, about your locks of gold,
For my fat head is feeling queer since I have caught a cold;
And when a bard is feeling off and full of pills and care
And has to sit around and cough, he sours on golden hair.

I cannot sing today, dear heart, about your coral lips.
The doctor's coming in a cart; he's making daily trips;
He makes me sit in scalding steam, with blankets loaded down,
And people say they hear me scream half way across the town.
He makes me swallow slippery elm, and ink and moldy paste,
And blithely hunts throughout the realm for things with bitter taste.

I cannot sing today, my love, about your swanlike neck,
For I am sitting by the stove, a dim and dismal wreck;
And many poultices annoint the summit of my head,
I've coughed my ribs all out of joint and I am largely dead.

And so the mention of a harp just makes my blood run cold;
Some other blooming poet sharp must sing your locks of gold.
Some other troubadour, my sweet, must sing to you instead,
For I have earache in my feet and chilblains in my head.

Some of the greatest names in humor's hall of fame come from the ranks of the newspaper writers. I have only to mention James Whitcomb Riley, Bill Nye, Bob Burdette, Mark Twain, Gene Field and a host of others of the last generation. And I feel that posterity will look with equal favor on the works of Edmund Vance Cook, Ted Robinson, Jack Raper, Strickland Gilliland, George Ade and Luke McLuke.

Luke McLuke, you know, is the genius who wrote that tender little bit of sentiment entitled, "We'll name the Baby Rosie, after Dear Old Father's Nose."

It is a mistaken notion, entertained by many people, that the professional joker is a sombre chap in private life, with the air of an undertaker. Nothing can be farther from the truth. When the members of the American Press Humorists get together in convention I can assure you they are a lively lot, and they like nothing better than to joke with and about each other.

At a banquet table one evening Judd Mortimer Lewis sat opposite Thomas Augustin Daley.

"I overheard you eating soup," said Lewis,

In an instant Daley gave back the answer: "Eavesdropper!"

A. Walter Utting of the New York Tribune, has a very large family. Eight or ten children, I believe. Or maybe it's fourteen. At any rate Walter was walking down Fifth Avenue one afternoon with the bunch trailing at his heels when a policeman approached him and was going to arrest him.

"I didn't do anything," Utting protested.

"If you didn't do anything," the copper inquired, "then what's this crowd follerin' you fer?"

When the late Cy Warmen was at the head of the traffic department of the Grand Trunk Railway he was standing near an engine one day when a native came up to him and asked him if he was connected with the railroad.

"Oh, in a way," Warman replied.

"What do you do?"

Pointing to a man who was inspecting the cars Warman asked: "See that fellow tapping the wheels with a little hammer?"

"Yes."

"Well, I help him listen."

The manner of selling jokes may interest you. Most of the jokes in the weekly and monthly humorous magazines are contributed by professional writers who conduct columns in daily papers. The writers make carbon copies of their efforts and send a lot to the editor for inspection. The editor usually selects what he wants or can use, and then sends the rest back.

I remember that the jolt of my young life came one day when I sent three jokes to Life and got four back.

There is no demand for jokes that might offend. The kindly joke is considered much better than the random shot. Here's what Uncle Walt Mason says about

THE RANDOM SHOT

I shot an arrow into the air, it fell in the distance I knew not where, till a neighbor said that it killed his calf, and I had to pay him eight and a half.

I bought some poison to slay some rats, and a neighbor swore that it killed his cats. So, rather than argue across the fence, I paid him a dollar and twenty cents.

One night I set sailing a toy baloon, and I hoped it would soar till it reached the moon, but the candle fell on a farmer's straw, and I had to settle or go to law.

And that is the way with the random shot, it seldom strikes in the proper spot. And the joke you tell that you think is smart, may leave a wound in some fellow's heart.

I gain inspiration for many of my stories by watching people and events. Once the germ of an idea is nabbed, a fertile imagination supplies the rest.

For instance, a small boy sitting on a curbstone with a tin can by his side attracted the attention of an old gentleman who inquired:

"Going fishing?" "Nope," said the boy, "take a peek."

The old gentleman looked into the can and found it was partly filled with caterpillars of the tussock moth.

"What are those?" he asked.

"Them's the fellers that crawls up the trees and eats the leaves all off."

'I know, but what are you doing with them?"

"I'm fooling them. I got a lot of them started up this telephone pole."

On a street corner stood a man who tried to interest people in an astronomical telescope.

"Take a look at the moon," he called, "only ten cents a peep."

"I don't want to look at the moon," said one man, "I believe in seeing America first."

An automobile, stalled in a side street, attracted the usual crowd of onlookers. Suggestion after suggestion was offered, but no one succeeded in starting the engine.

Finally, the door of a fine residence near at hand was opened, and a masterly looking chap came toward the crowd.

Taking one look at the machine he inquired:

"Anybody got a buttonhook?" A dozen were instantly proffered.

Placing one foot on the nearest tire the masterful man observed:

"I came out in a hurry and forgot to button my shoes."

Here is a little story I sold to Lippincott's magazine several years ago, and it is still going the rounds:

A tall, gaunt young fellow entered the office of the Globe Museum and Family theater the other day and asked for the manager.

"I want to get a job in the theater," he explained.

"Who are you?" the manager asked.

"I am Enoch, the Egg King."

"What do you do?"

"At one sitting I can eat three dozen hen eggs, two dozen duck eggs and one dozen goose eggs."

"Do you understand our policy here?"

"Whaddye mean, policy?"

"We give three shows a day here. Think you could stand it?"

"I know I could."

"And on Saturday we usually give an extra performance."

"All right."

"And on holidays we give a performance every hour."

"In that case there's got to be one thing understood."

"What's that?"

"No matter how busy we get in the museum, I've got to have plenty of time to go out and get my regular meals."

Feminine attire has always been a fruitful source of jokes, and there is really a reason for it. The joker has a right to poke fun at the short skirts because it has long been a popular saying that "brevity is the soul of wit."

However, the prettiest compliment I know for woman was written by a newspaper humorist. It is Samuel Ellsworth Kiser's fanciful conception of

GENESIS

'Tis said the Lord made Woman from the crooked rib of man.
Let others think the story true, if it may please them so to do,
I don't and never can.

I think the Lord made woman first; took of the best he had,
And labored earnestly and long, and as he shaped her hummed a song,
And in his heart was glad.

I fancy that he watched her grow more perfect day by day
And that he studied well to know just where each little dab should go
While putting on the clay.

How doubly glad he must have been while modeling her face,
While fashioning her rounded chin and putting all the dimples in
Each in its proper place.

There, on her pedestal she stood, the work of many days,
And God was no doubt glad at heart to view the product of his art
And gave her honest praise.

How sweetly in the garden there, at first her laughter rang,
How gladly must the birds of air and all the creatures everywhere
Have listened when she sang.

But sadness marked her mein, ere long, her cheeks began to fade,
She ceased to sing her happy song, and God, surmising what was wrong
Had pity on the maid.

He took the dust beneath her feet, she looked with wondering eyes,
And danced, and clapped her hands in glee, as, watching, she began to see
A shapely man arise.

"There", said the Lord, when he was through, "do with him as you will
"I give him soul and all to you." She played with him and laughed anew.
He is her plaything still.

(Applause.)

As a further tribute to the ladies I will offer a little serenade not after the fashion of the bards of old, but in a newer and more novel manner.—a whistling solo:

Toastmaster Deckman: Is there anything you wish to say, Mr. Randall?

Secretary Randall: You can all readily understand, after the many laughs we have had, why we have saved the best, in a way, until the last. We are very grateful indeed to our honored guests who have contributed so generously to our feast of reason. Their eloquent and patriotic words are an inspiration to us, and we will remember them in the years to come with delight.

Toastmaster Deckman: You will now be dismissed to the pleasure of your homes.

ACCEPT INVITATION TO VISIT UNIVERSITY OF ILLINOIS.

The Illinois Chapter of the American Institute of Architects and also the Illinois Society of Architects have accepted an invitation extended by the dean of the College of Engineering to visit the University of Illinois and especially its department of architecture, on Thursday, May 4. President Prindeville, of the Institute, and President Davidson, of the Association, have expressed their personal interest in the matter. The joint party will leave Chicago at 9:15 in the morning, arriving in Champaign at 12:43 in the afternoon. After being served with luncheon, the visitors will be shown about the university, the last two hours of their stay being given exclusively to the department of architecture, The party will leave in return at 5:50 p. m.

Written for The Clay-Worker.

NEW YORK CITY GROWING AS A GREAT CONVENTION CENTER.

The Second World Court Congress Will be Held There May 2-4, 1916.

THE MERCHANTS ASSOCIATION of New York is a live, up-to-date organization, the purpose of which is to "Foster the trade and welfare of New York." It now has forty-five hundred members, in which are included many of the leading merchants and business men of the metropolis. Among other things the Association is giving particular attention to conventions, of which a large number meet there at all seasons of the year. In a recent publication the convention committee calls attention to the advantages and facilities offered in various ways for the edification of those who are interested in meetings for educational, industrial and commercial advancement. As never before Father Knickerbocker is welcoming with outstretched hands every organization that meets within the city's gates and has for its objects the betterment of social and industrial conditions or progress in the arts, sciences and professions.

Hotel Astor and Its Attractions.

New York has so many natural attractions that conventions there are always largely attended, and now that the Merchant's Association, through its convention committees, is giving special attention to conventioners it will grow in popularity as a great meeting place. No other city in the world affords better facilities in the way of convention halls, hotel accommodations, etc. No other city in the world has so many really fine hotels. Among the great hotels of America, Hotel Astor easily maintains supremacy. Its central location and its many attractions makes it justly very popular. It is but a few minutes' ride by street car from the Pennsylvania and New York Central stations. It fronts on Broadway and occupies a block between Forty-fourth and Forty-fifth streets, in the very heart of the great "White Way." It has a thousand guest rooms with a score or more of dining and assembly rooms in which are held many important functions. Balls, banquets, concerts, theatrical performances—a dozen or a score a day—fill every part of it with constant interest. Hither come representatives of the big business interests to meet for consultation. Here are held receptions for distinguished foreign visitors and ambassadors, and here they are afforded luxuries, comforts and service not excelled anywhere, and seldom equalled.

Hotel Astor is a great brick and terra cotta structure, and we are pleased to present to our readers the accompanying photograph of it, from which they will get an idea of its immensity. Its roof garden is one of the finest summer resorts in the city. There are reception rooms, conservatories, the orangerie, and innumerable dining rooms and parlors which may be used for convention purposes when occasion requires.

The Second World Court Congress.

Among the notable gatherings to be held in New York City in the near future is the second World Court Congress, which occurs May 2, 3 and 4. The first meeting of that great body was held in Cleveland in May, 1915, and those who were present then will not willingly miss the coming Congress, which has for its purpose the establishment of an International Court, through which international disputes may be adjusted by legal procedure instead of by the right of might. The rule of the sword will give way to the rule of reason, and what a God's blessing that will be to men and women. The frightful spectacle now enacting in Europe, the dreadful, wanton waste of human life, with its train of unbelievable woes and grief, might all have been avoided had our boasted civilization been as potential as we fondly fancied it to be, and the blessings of the World's Court as now contemplated been in vogue before war was declared.

It is a great conception, this idea of a World's Court, and it should be encouraged in the interest of common humanity, right and justice. There is no right and there is no justice in the dictum of any potentate or government faction which compels human beings to sacrifice themselves by the thousands and ten of thousands as is being done in Europe, and all for no other purpose than the vain glory of military mad monarchs. All honor to John Hays Hammond, Henry Clews and the noble men associated with them in this movement, which has for its object the ending of international strife, the horrors of war and the substitution of reason and justice.

The National Brick Manufacturers' Association has been requested to send delegates to this World Court Congress, and a number of the members of the Executive Committee have signified their intention of attending, and will gather at Hotel Astor. It is a voluntary service and any of the members of the N. B. M. A. who may care to do so will be more than welcome. The sessions of the Congress are open to the public. Delegates will register at Carnegie Hall at 1 o'clock, Tuesday, May 2.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

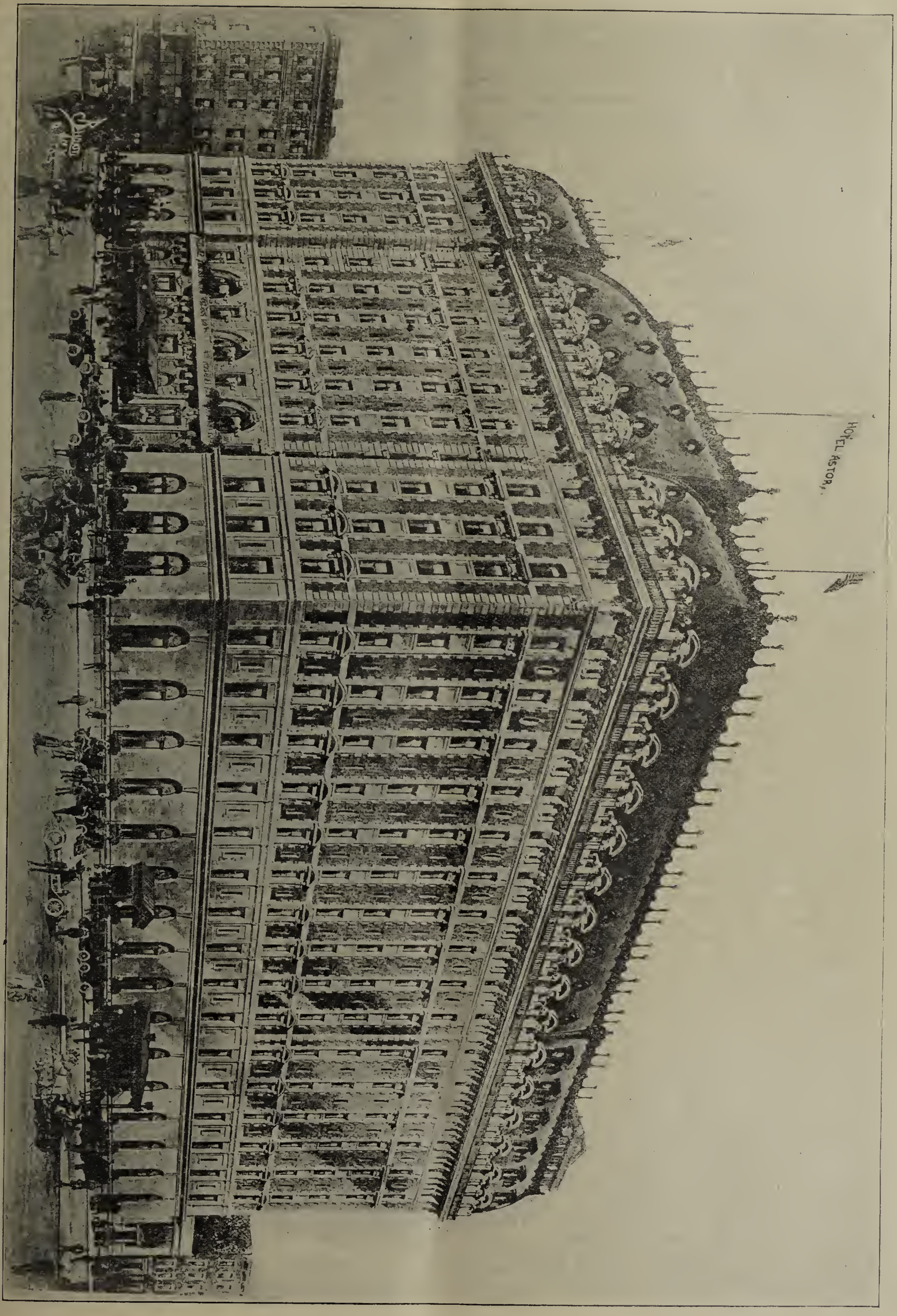
THERE IS considerable building activity, not only in Milwaukee, but all over Wisconsin, and brick manufacturers, jobbers and dealers are meeting with a satisfactory business at this time. In Milwaukee, the total building investment thus far this year shows a gain of more than $2,500,000 over the corresponding period in 1915 and the indications are that a new high record will be established this year. Building Inspector W. D. Harper says that there have been enough large building projects launched to assure an exceptionally busy season. During the month of March there were 300 permits issued for structures to cost $994,521, as compared with 420 permits and an investment of $949,949 a year ago.

Brick manufacturing plants all over Wisconsin are opening up and all are preparing for a busy season. Indications are that stocks in the hands of jobbers and dealers are not especially heavy and a good business is anticipated in the general building brick line. Many manufacturing concerns installed new equipment during the winter and are now prepared to increase their output in anticipation of a busy season.

The J. B. Theriault brick yards at Chippewa Falls, Wis., have been purchased by William Henneman, who is organizing a new company which will put the Chippewa Falls yards in working order again. The new concern will have an almost unlimited supply of fine brick clay available and it is expected that the yards will be run to their full capacity.

With the incorporation of the Wisconsin Face & Fire Brick Company, of Milwaukee, announcement has been made of the launching of a new and enterprising concern which ought to be an important factor in the Milwaukee field. The capital stock of the new concern is placed at $15,000, and the incorporators are Emil M. Kraatz, John J. McCoy and Robert J. Steele. Officers have been elected as follows: President, Emil M. Kraatz; vice-president and treasurer, John J. McCoy; secretary, Robert J. Steele; sales manager, Ralph Van Roo. The new company has announced that it has taken over the Pennsylvania Coal & Supply Company's business in face and fire brick and will maintain offices in the same quarters occupied by the Pennsylvania concern on the second floor of the Caswell building.

Ricketson & Schwarz, well known brick firm of Milwaukee, was awarded the contract for furnishing 450,000 face brick for the new hotel which is being erected at West Water and Sycamore streets, by the Plankinton Improvement Company. The contract for furnishing the common brick went to F. G.



Hotel Astor, Broadway, 44th and 45th Streets, New York City, Rendezvous for Members N. B. M. A. During World's Court Congress, May 2, 3 and 4, 1916.

Mority, 312 Caswell building, and the contract for the hollow tile to the Pennsylvania Coal & Supply Company. The contract for furnishing the brick for the new warehouse which is being erected at Eau Claire, Wis., by the H. Cary & Son Transfer Company, was awarded to Ricketson & Schwarz. This firm has also been given the contract to furnish the terra cotta on the Commercial building, which is being erected at Wells and Third streets, Milwaukee, for the American Investment Company.

The Tittemore freight case, in which brick manufacturers of Wisconsin have been much interested, was brought to a close before the Wisconsin railroad commission on March 31. Briefs and arguments will be submitted soon, but the commission will proceed at once with an analysis of the testimony. The case, which has attracted wide attention and is said to have been one of the most important ever brought before the Wisconsin railroad commission, was handled by J. B. Tittemore, who seeks to bring about a general readjustment of freight rates in Wisconsin. During the closing hours of the hearing, Traffic Manager Eyman, of the Chicago & Northwestern road, was on the stand. He admitted that the classified rates in Wisconsin had been practically abolished. He also said that it would be necessary for the commission to take into consideration the relationship between state and interstate rates. This has been from the beginning the principal contention of Mr. Tittemore. The exhibits submitted by the railroads are, possibly, the most elaborate submitted before any commission at any time, except possibly the exhibits submitted before the interstate commerce commission in the so-called western advance rate case.

Indications are that there is to be considerable brick paving carried on all over Wisconsin this season. Most of the Wisconsin cities have been doing an increasing amount of brick paving during the past few years and it looks as though 1916 would be no exception. The popularity of brick paving is growing in Milwaukee. At a recent meeting of the Green Bay Avenue Advancement Association, in this city, a resolution was adopted favoring the use of brick for a proposed new pavement on Green Bay avenue, one of the important business thoroughfares of the north side. A resolution, adopted at a previous meeting, which favored creosote block paving, was rescinded. The common council at Wausau, Wis., has awarded to the Conducive Paving Company, of Forest Park, Ill., the contract for 30,000 square yards of vitrified brick paving on Forest street and Grand avenue, at $2.02 per square yard. The Peterson Construction Company, of Kenosha, Wis., has been awarded the contract by the common council at Marshfield, Wis., for laying 16,000 yards of vitrified brick paving at $2.10 per yard. George Welch has been given the contract for laying brick paving at Beloit, Wis., at the contract price of $1.98 a yard. The Murphy Construction Company has been given the contract for laying the brick paving along the street car tracks on North Eighth street, in Manitowoc, Wis., at $2.59.

A strong argument in favor of brick paving was presented in Milwaukee during the winter just closed, when large sections of creosote block pavement had to be chopped away because heavy rains, followed by sudden cold weather warped or crowned the wooden pavement to such an extent that driving over it was precarious. Frank Blodgett, superintendent of paving, said that the trouble was caused by the hard rain and the severe cold weather immediately ensuing, the frost expanding the wood wider than the tar joints allowed. A large section of the wood pavement was chopped away on State street, adjoining the Milwaukee Auditorium. On Upper Wells street another large section was taken up. Superintendent Blodgett hopes to avoid this difficulty with the wood paving hereafter by allowing wider expansion joints.

A fine proof of the durability and long life of brick for building purposes has been given in Milwaukee, where the historic Plankinton hotel has been dismantled to make room for a new structure which is going up on this important site. Although the building was erected nearly fifty years ago, the brick taken from the structure were practically as good as new and 200,000 of these brick have just been sold by the American Wrecking & Salvage Company to Eigal Brothers, for $4.50 per 1,000. The brick which went into the historic old Plankinton hotel were some of the cream colored brand, so widely used here and which eventually resulted in Milwaukee being known the country over as the "Cream City."

A. BADGER.

THE MEETING OF THE INSTITUTE OF PAVING BRICK MANUFACTURERS.

A Rare Combination of Business and Pleasure.

PORTSMOUTH, OHIO, was the mecca for the paving brick boosters April 12, the occasion being the regular quarterly meeting of the Institute of Paving Brick Manufacturers. The meeting was one of the most successful of any yet held—thanks in a large measure to the kindly cordial spirit of hospitality evinced by the local paving brick firms, Messrs. Carlyle and Peebles. The senior members of both firms are old-time members of the N. B. M. A. and know from personal experience that brick men when attending associational gatherings like to entertain themselves to a great extent and enjoy most the inspection of plants in operation. They were afforded an exceptional opportunity in the visit to the plants of these firms, which are well arranged and tidy to an unusual degree.

Then, too, Portsmouth is itself an excellent object lesson of the virtue of good brick streets. It is a city of nearly 50,000 people and is paved exclusively with brick. There are thirty miles of good brick streets within the common wealth and the oldest of them, even those which have been down twenty years or more, are in good condition. Of course, those recently laid show marked improvement in smoothness and general excellence, due to better methods of construction, but they are all good streets, sanitary, clean and comparatively smooth, and entail no expense whatever for maintenance.

Portsmouth demonstrates the benefit of good team work. Messrs. Carlyle and Peebles are competitors, but they are blessed with the God-given talent of horse sense, and have worked together effectively for the permanent improvement of local streets and highways. That is one reason why Portsmouth is an exclusively brick-paved city. It is an old and thrifty city and an important manufacturing center, being the home of a number of extensive steel plants and shoe manufacturies, giving employment to thousands of workmen, not a few of whom are home owners who have been taught the benefit of home industries. Hence they prefer to pave their streets with brick made in Portsmouth, not alone because they are made in Portsmouth, but because they know from experience that brick pavements are clean and durable to a greater degree than any other paving material.

The active members of the Institute are intimately connected with the operative end of the paving brick industry, and when a bunch of such men get together in a friendly way there is an interchange of ideas and experiences very beneficial to each and every one. The wisest of us may learn from the dullest of us when our efforts are directed toward a common end, and so the meetings of the Institute are proving of great importance and help to the members. Each of the local plants were visited, automobiles being furnished for the purpose by the local manufacturers. In the evening an associational dinner was thoroughly enjoyed and then President Kanengeiser called for order and the members proceeded to talk shop in a frank and open way that was a revelation to some of the visitors who were not familiar with the spirit of the Institute.

Importance of Uniform Cost Accounting.

Cost Accounting was the chief topic of discussion and it is a very important detail of the business which has not been given the consideration in the past which it deserves.

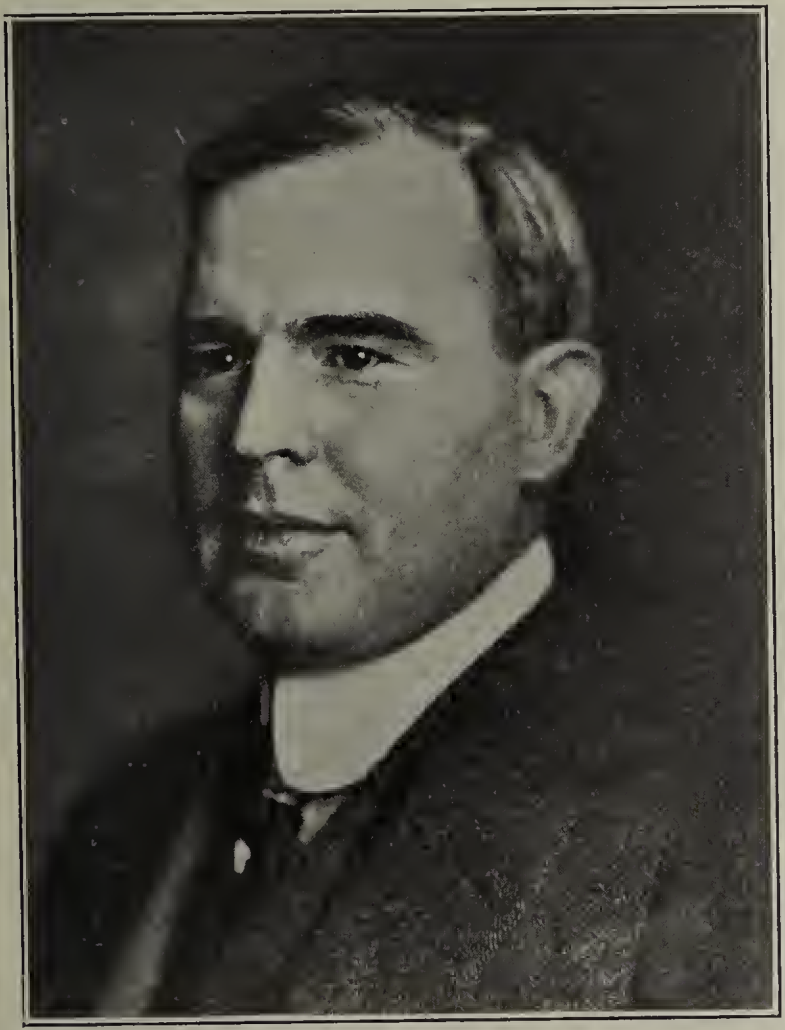
An interesting and instructive paper on the subject was presented by Mr. C. C. Blair, of Youngstown, Ohio, which is reproduced in full.

COST ACCOUNTING FOR PAVING BRICK MANUFACTURERS.

By C. C. Blair, Youngstown, Ohio.

The speaker does not propose to enter into a lengthy discussion of the philosophy of costs. We take it that what is more to be desired in a meeting of this kind is an outline of practical methods rather than a discussion of ideals.

The principal (I should not say, perhaps, the only) purpose of the brick manufacturers is to make money. In order to accomplish this where competition is keen and the margins are small, it is absolutely necessary for the manufacture to have an accurate and proved cost system. The system should show him not only the unit cost, but it ought to present also a clear and vivid picture of plant conditons. It should be in such form that it can be readily used for the purpose of comparison between different departments and between different plants for various periods.



C. C. Blair, Youngstown, Ohio.

It is vital to know the unit cost as this is the only true basis for an intelligent selling price. It is necessary to the success of any concern that the selling price be based on cost plus a fair profit rather than on the selling price of competitors who may or who may not have a proper understanding of costs.

At this point we wish to make it clear that the cost of a completed article does not end until it is placed on the market. We mean by this that the sales cost is a proper one to include and must be added to the manufacturing cost. We fear, in fact, we know, that the sales cost is overlooked by many paving brick manufacturers. Let us not forget that the cost continues until the brick are delivered to the buyer.

There are many complicated systems of cost in use by manufacturers in different lines of business, necessarily complicated by the nature and diversion of their product. Brick plants accounting and cost systems for brick plants are comparatively simple, on account of the fact that most plants do not make more than one or two different products, and they being so similar are readily reduced to a common basis.

In making up a cost system the first thing to consider is the establishment of a basis from which to work. This may be a tonnage a block or a standard brick. Many firms are using tonnage, and, all things considered, we believe this the best where two or more sizes are manufactured. At the present time our company is using the block or ten-pound basis, which means practically a tonnage basis.

With the basis established we would divide cost as follows:

First—Direct Labor.

Second—Material and Supplies.

Third—Overhead or General Expense.

Fourth—Depreciation.

With these divisions before us it now seems advisable to outline just what information is wanted for the use of the superintendent and foremen. All detail information is of no use to any one except the superintendent and his assistants. They are the ones who should benefit the most from an accurate detailed cost sheet.

Surprising differences can be noted in different departments of different plants where they are apparently working under conditions very much alike.

After determining the information wanted it becomes a matter of detail as to how the information shall be gathered.

For convenience in handling cost items we have found it very desirable to establish a card of accounts covering all departments and subdivisions. Each separate operation is given a number and is known as, for instance, No. 20, instead of machine room labor, or No. 30 for machine room supplies.

This at first may seem a little confusing to the inexperienced, but, once learned, it is much the simpler way to handle a large number of detail operations.

This card of accounts should be made to cover every detail of labor, material expense and depreciation in the manner which it is desired to be shown by those in authority. When the card of accounts is completed in accordance with the plan laid down, we have the outline of a complete cost system.

We shall now turn our attention to the main divisions of the system. The first division, direct labor from the standpoint of accounting, is the most easily handled, and there is no reason why, with a little care, this should not be kept absolutely accurate. The information wanted may be gathered from time slips prepared by the foreman or timekeeper or from records kept by the laborers themselves. Our experience has taught us, in the interest of accuracy, that the records should be audited by the head timekeeper, who checks up the reports daily with the time cards.

The reports are then passed at once to the pay-roll clerk, who enters them on the pay roll under the proper cost account, after which a daily statement of labor cost is made. These daily labor costs are very important to the superintendent, who, after going over them, is able at once to put his fingers on any unusual condition, and should any department fall below the usual standard it can be looked after at once. After all time is entered and computed for the month, we are able to obtain from the pay roll the total labor cost for each department and subdivision.

Material and supplies, the second division or second item of expense, we find a little more difficult to handle. While it can be made accurate over a period of months, there is some use for the imagination in making up the monthly reports.

If a store room is operated (and we believe a store room should be operated even in the smaller plants), such articles as pass through and are given out by the storekeeper can be very well taken care of. Experience will show what per cent, if any, it is necessary to add to different articles to make up shrinkage. Such items as cannot be carried in a store room or be under direct charge of the storekeeper, or such supplies as are wanted at the plant for sake of convenience, can be taken care of by monthly inventories. In our plants, coal, oil and setting sand are handled in this way. All other items delivered to the plants that are liable to be lost sight of are charged direct to the cost of the proper department immediately upon delivery. There may be some reasons to criticise the direct charge of articles not used at once, but our experience tells us if this is not done a large inventory invariably appears where there is no material to take care of it. We have treated this division of costs from the standpoint of supplies. The material purchased which goes directly into the product is practically a negligible quantity in most paving brick plants. However, if any raw material is purchased it can easily be handled in the manner just described.

This brings us up to the third division, general expense, which is commonly known as overhead. This consists of indirect labor, such as machine shop work, office help, salesmen, superintendents and manager. It also includes office supplies and material not chargeable direct, insurance, taxes, royalties, association dues, promotion expenses, and such items must be included under this head. We do not suppose where there are two or more plants working under one head that a system has ever been worked out that has been entirely satisfactory in the division of this expense, but it is chargeable to the product, and we have found it most satisfactory in the long run to divide on a production basis all items that come in for the period of the report. Insurance and taxes can be charged direct to the proper plant, but should be apportioned as near as possible each month. There are many things affecting the overhead charge where there is more than one plant or more than one variety of article manufactured. For example, the production of one plant goes up while another may remain stationary, or may even decrease. You can readily argue that a plant with increasing product should be given a benefit as against a plant whose product is stationary or decreasing, but taken from month to month in a well-regulated concern this will adjust itself or reach such a stage that some other basis for division must be used. If the cost system is a proper one the condition first described will be discovered in time and remedies effected that will make a new basis unnecessary.

This brings us to the fourth division, depreciation. From talks I have had with different manufacturers, I am led to believe there are almost as many methods of handling this as there are companies operating.

For many years our company took inventory of all plants and properties at the end of each bsuiness year and charged off a certain percentage. At present we are charging to depreciation on plants and machinery at a certain rate per thousand block, and we have considered applying the same method to our raw material supply. We would not advocate an excessive depreciation charge that would wipe out the investment in a few years, and we just as certainly take issue with those who do not make any charge for this item, but claim to keep their plants up to standard at all times and count them as good as new. This is a very common practice for those who are just starting in the business with new plants. If this practice is followed, sooner or later the owner is going to wake up and find his supposed profits are nothing but a run-down plant. When a certain machine or kiln or anything else around the plant reaches the stage where it must be replaced, we find our plant depreciation very convenient. It takes care of replacement without disturbing current costs, and we consider it perfectly proper to make use of it in this way. We do not wish to be misunderstood on this point; replacements are handled entirely apart from our ordinary plant maintenance and repair, which are legitimate cost items and cannot be drawn upon for replacements.

We have endeavored to outline to you in a brief way what we have found to be a practical method of cost-keeping. The system which we have in use is the result of ten years' study along this line. We have made changes from year to year and we hope to make further improvements from time to time. A good cost system is not built in a day; it must be changed to meet the changing conditions in the business, and should be kept up to date at all times. We are only just beginning to understand the value of a proper system; the advantages to individual plants are innumerable. How much more valuable it could be made if a uniform system could be adopted by all plants and comparison be frequently made. We would be glad at this time to compare cost with any of the manufacturers who can see this in the same light as do we. Much good is bound to come to all parties of such an exchange; not only will glaring faults be pointed out (for we all have them), but the manufacturers will be drawn closer together in the study of their plant problems, just as they have been drawn together with sales and promotion problems. The more we know of our friends, their conditions of manufacture, their product, their troubles and their joys, the more interest we will have in them, the more joy and satisfaction we will have in our own work. (Applause.)

Following Mr. Blair's paper cost accounting was considered, all present agreeing that it was of paramount importance. The various angles of the proposition was considered earnestly. A professional accountant was present to give the members the benefit of his knowledge and observations. After two hours of earnest discussion it was agreed that the matter should be referred to a special committee to confer with the entire membership and to devise ways and means of securing an informal method of cost accounting which will enable paving brick manufacturers to co-operate more effectively in this important detail than they have in the past.

It was voted to hold the next meeting at Alton, Ill., in July.

The following is a list of those in attendance:

Active Members.

G. E. Carlyle.
H. A. Ford.
F. R. Kanengeiser.
R. B. Keplinger.
W. G. D. Orr.
O. W. Renkert.
R. C. Wallis.
D. C. Wilcox.
S. M. Duty.
M. E. Gregory.
Paul Kanengeiser.
Allen B. Kline.
S. C. Peebles.
F. E. Shultz.
C. L. Weaver.
F. W. Wood.

Associate Members.

C. C. Blair.
C. W. Finney.
D. A. Moulton.
I. P. Nielson.
R. T. Stull.
W. H. Terwilliger.
E. C. Zorn.
J. Brennan.
M. C. Gregory.
H. B. Murray, Jr.
T. A. Randall.
C. M. Stewart.
S. D. Wonders.
A. F. Smith.

Builders' Exchanges Elect Officers.

The Worcester, Mass., Exchange, after listening to favorable reports for the year at its annual meeting, chose these officers: President, George W. Kilner; vice-president, H. C. Wilson; treasurer, A. P. Robbins; secretary, A. H. Skillings. In September of this year the exchange will celebrate its twenty-fifth anniversary.

The Hartford, Conn., Exchange has chosen these officers: President, Robert H. Fox; vice-president, Dominick Tremonto; secretary, Francis Hendren; treasurer, Thomas Wester.

Leading builders in Hudson county, New Jersey, really Jersey City, have organized the North Jersey Master Builders' Association, and have elected these officers: President, Samuel H. Rubine; secretary, Samuel Horwitz; treasurer, Max L. Baylene. Regular meetings are the first and third Thursdays of each month.

The New York Builders' Exchange, after many years in the downtown section, is considering removal to the new building zone around the Grand Central Station. The exchange now oversees virtually all the building from the Connecticut line to Perth Amboy, N. J., and from Long Island to New Brunswick, N. J.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

CONVENTION ECHOES.

Members Should Attend Sessions.

Dear Mr. Randall:

I will always remember the convention at Cleveland as one of the largest and best we have ever had, and I thoroughly enjoyed it; but do believe we made a mistake in holding the convention at a time when there is so much to take the attention of the brick people from the actual sessions of the convention.

It is true we get a full report of these in The Clay-Worker, but in order to get the full benefit of the convention I believe every brickmaker ought to make it a point to attend every session.

With kindest regards and best wishes, I am,

Yours very truly,

Buffville, Kans. B. W. BALLOU.

Faith in the N. B. M. A.

Mr. T. A. Randall, Secretary N. B. M. A.:

My Dear Randall—Permit me to acknowledge at this time my gratification and pride in the honor which was conferred upon me at the Cleveland meeting by election to honorary membership in the N. B. M. A.

I have always been a loyal supporter of the organization, ever since I first attended its meetings in 1894, and at no time have I lost faith in the good that this Association can do, or in its value to the clay industries of the country. I believe its usefulness and value to its members and to the industry will be as great in the future as in the past, and shall not spare efforts so far as my work and influence goes, to help to bring about its most favorable result.

I ask that you will express to the Executive Committee and to the members of the Association my sincere thanks for this honor conferred. Very truly yours,

Columbus, O. EDWARD ORTON, Jr.

Banquet One of the Best to Date.

My Dear Randall:

Since returning home from the Cleveland convention I have been thinking about some of the good things that we enjoyed while there. Cleveland certainly gave us a hearty welcome and the papers for the convention and discussion were among the best it has been my privilege to listen to in the number of years that I have been in attendance at these very instructive conventions.

The banquet was certainly one of the best we have ever had and the speeches were all fine, and I congratulate you on the general results of the program of entertainment, as well as of instruction. Yours very truly,

Clinton, Ind. J. W. ROBB.

Appreciates Honor Conferred.

Mr. Theodore A. Randall, Secretary National Brick Manufacturers'

My Dear Mr. Randall—Allow me to address you, as secretary, to express to the National Brick Manufacturers' Association my heartfelt appreciation of the high honor bestowed upon me at the convention which adjourned recently in Cleveland.

It was indeed the greatest surprise of my life to be elected an honorary member of this Association, as I never, even in the slightest degree, deemed myself worthy of such a compliment. It is difficult for me to find words fitting to tell you of my deep gratitude for this expression of confidence. For years I have drawn from the Association friendship, knowledge and inspiration, and what little I may have been able to do is but a meager return for the benefits derived. Your action, more than ever, makes me your debtor and compels me to realize that I must serve our cause more efficiently.

Those of us who have been affiliated with the N. B. M. A. for the last fifteen years and have seen it steadily pursue its useful course cannot help but have a feeling of affection for it. This feeling is magnified by the realization that within its ranks we have found many friendships close to our hearts.

The splendid convention at Cleveland illustrated the vigor of the Association and was an inspiration to all. By laboring faithfully for the cause of the N. B. M. A. we shall be working not only for the good of the industry, but we shall serve our state and our country as well.

Again expressing my deep appreciation and gratitude, I beg to remain, Yours very sincerely,

Pittsburg, Pa. (Signed) A. V. BLEININGER.

Convention Full of Good Things for Every One.

My Dear Mr. Randall:

We are back home from the Cleveland convention. There were so many big things crowded into this gathering of brick and material men, it was impossible to take in all that was dished out, but to me there were two things predominated, of special interest and importance to the building brick manufacturers—systematic, educational advertising. I never heard a clearer cut, cleaner exposition of advertising than that given by Mr. Wreford, of Detroit, which should, and I believe will, be followed by every community.

Second, trade courtesies and square dealings with your competitors, the lack of which is largely responsible for the poor brick business. The more we can get the manufacturers together in gatherings of this kind, the more rapidly will this friendly spirit spread, and the more prosperous will become the brick business.

I hope Virginia will be better represented at the next convention. Sincerely yours,

Suffolk, Va. A. V. STURGEON.

An Echo from the Building Show.

Dear Mr. Randall:

At your request I am writing you briefly on the subject of creating a demand for brick for residence construction by the general building public.

My judgment of several years past has been confirmed by my canvass of the crowds attending the Cleveland Building Show, which I did very thoroughly by advertising a $3,500 seven-room residence. The home-building public are thirsting for knowledge of some material of a lasting and imperishable quality with which to build their homes. They are heartily sick and tired of the extravagant, heavy cost of upkeep incidental to all wood construction, but on account of the almost universal use of wood for house-building in the greater part of America, they know of nothing better to use.

Thousands of home-seekers expressed great surprise that I was offering to build a beautiful seven-room house so cheaply, and I am quite safe in saying, Mr. Randall, that my modest exhibit attracted more real interest from the moderate-priced-home seeker than all of the grand artistic brick exhibits in the show, because I told them just what a completed house would cost and where they could see it already built and for sale at the above price.

In fact, I think that the very elaborateness of many of the brick displays actually drove the man of modest means away from thinking of a brick home, because he felt that it was meant only for the wealthy, who have means to purchase works of art.

Mr. Randall, it is high time that the brickmaker, and particularly the brick dealer, awake from their fifty years' Rip Van Winkle sleep and take advantage of the opportunity being thrown at their heads. Hundreds of lumber dealers are sending out thousands of circulars daily, showing how beautiful frame houses can be built for a moderate cost, and this in face of the fact that lumber has steadily advanced at the rate of one dollar per thousand per year for the last forty years; within the past six months it has gone up from three to five dollars—and still the brick man sleeps on.

Now, Mr. Randall, I want to give the brick man one more word of counsel. Let the face brick man, the common brick man and the hollow tile man stop their petty bickering among themselves and lend their united efforts to educating the general public that a very beautiful home can be made at a very moderate cost, of the commonest kind of brick or tile, if burned of a hard quality, being laid up in artistic bond and well blended with suitable mortar colors.

After the public has been taught that any hard-burned clay is everlasting and that clay can be mined in nearly every county in America, and is therefore inexhaustible, and that the price will never vary much from normal, they will then demand that their homes be built of burned clay.

I am quite safe in saying that if the lumber men were to change places with the brick men, there would not be one frame house built where there are now ten. For the good of the cause.

Cleveland, O. JAS. J. HINDE.

Approves of Increase in Fee.

Dear Mr. Randall:

Your letter received, also the bills for the Stiles & Son and Stiles & Hart, and we will enclose you our check for $5.00 for each company, paying our annual membership fee. We think that the money is well spent, and we think with a little increase it will be a benefit for the whole brickmaking interest. And think it is well to have the little increase and trust every one will feel disposed to pay the same promptly and that it will help along the good work. Yours truly, J. F. REYNOLDS,

The I. L. Stiles & Son Brick Company.

North Haven, Conn.

N. B. M. A. Convention Not Surpassed By Any Other Organization.

My dear Mr. Randall:

I have attended conventions and conventions. That recently held at Cleveland was one of the great ones. Its generous attendance from all sections of the United States and Canada, clearly shows that there is still great activity in the good old clayworking industry.

The unabated interest in the many topics discussed at the various sessions of the N. B. M. A. and of the allied associations meeting with us, is convincing evidence that our members appreciate the value of scientific investigation and research as applied to our chosen industry.

Every one I met felt fine. Most of them were optimistic for the future. They were planning for more and better business, and altogether left the impression that they were a courageous, energetic, prosperous lot of fellows.

Entertainment? Well, yes, some. Always good. Never better. I am a member and pretty regular attendant upon the sessions of a number of great national business men's associations, and it is my opinion that as a business and pleasure combination the N. B. M. A. has no superior.

Yours truly,

L. W. PENFIELD.

Considers Membership Fee A Good Investment.

Dear Mr. Randall:

Your bill for increased membership fee at hand. I am pleased to enclose check for $5.00 covering same. The opportunity afforded by the convention of meeting and chatting with many friends and acquaintances during two or three days is alone worth the $5.00, and more.

Kankakee, Ill. HAROLD COPPING.

The Best of All N. B. M. A. Conventions.

Dear Mr. Randall:

Yours of the 22d received, also the March Clay-Worker with the full report of the convention, which is very fine. As you know, I have attended many N. B. M. A. conventions and wish to say that from both a business and a pleasure standpoint, I regard the recent meeting at Cleveland the best of all N. B. M. A. conventions. Of course, for our concern, it was very much "business," due to the fact that we were able to show the delegates our machinery in the large brick yards that we have equipped there the last year. We congratulate you and the other officers of the Association on the good work done so far and hope that the next convention, wherever it may be held, will be equally well attended.

ROY C. BENNETT.

Wellington, Ohio. The Wellington Machine Co.

Substantial Evidence of Appreciation.

Dear Mr. Secretary:

Your bill covering seventeen memberships duly at hand, and we are pleased to hand you herewith check for $85.00 covering same. It is needless for me to add that in common with all of our representatives who were in attendance at Cleveland, I enjoyed the convention immensely. The increasing of the membership fee is a step in the right direction and I trust it means an increased field of usefulness for the N. B. M. A. F. L. HOPLEY, Advertising Dept.,

Bucyrus, Ohio, American Clay Machinery Co.

Suggestions for Future Conventions.

My Dear Mr. Randall:

When the Detroit contingent of brick manufacturers returned home from Cleveland, after a most enjoyable week, we discussed the various phases of the convention, all of which were exceedingly gratifying with, perhaps, one exception, that of the smoker. We were all disappointed in the change of program, making that a smoker instead of a smokerette. We naturally hoped that the innovation, or good example, set here in Detroit the previous year, by having all formal entertainments participated in by the ladies, would become a rule at all future meetings.

While not wishing in the least to criticize the Cleveland convention committee, on the contrary their efforts should be exceedingly gratifying, even to themselves, we are convinced that it would have been better if the original plan had been carried out and the smokerette given instead of the stag party. So convinced are we of this, we want to urge upon you the wisdom of avoiding stag parties in future conventions.

Perhaps this could best be handled in a way that would safeguard you by suggesting the passing of a resolution that in the future all entertainments of a formal character be first submitted for the approval of the executive committee.

We are convinced of this by the many expressions of approval of our smokerette by all the visitors to Detroit during convention week, the ladies, in particular, expressing great satisfaction with that form of entertainment.

You can readily see that we have no personal interest in

J. F. Reynolds,
North Haven, Conn.

Roy C. Bennett,
Wellington, Ohio.

L. W. Penfield,
Willoughby, Ohio.

the matter, but make these suggestions in the interest of the N. B. M. A.

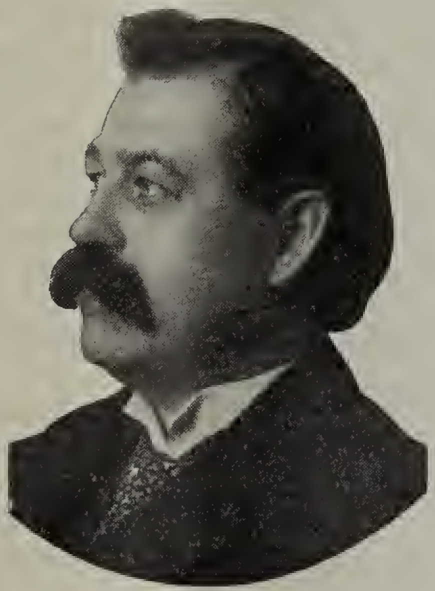
Cordially yours,
WM. B. WREFORD,
Manager Detroit Brick Mfrs. and Dealers' Association.
Detroit, Mich.

The Cleveland Convention A Very Great Success.

Dear Mr. Secretary:

To my mind, and I think I voice the sentiments of the entire Canadian delegation, the Cleveland convention, from every point, was a great success. I congratulate you, for I know it is due to the energetic work of the secretary. The attendance at the sessions does not indicate in any way the value of the convention, inasmuch, as all the papers read are printed afterwards. If you had been around the halls as I was, you would have seen a great number of groups of men discussing problems which had arisen, and you would have seen a great many social groups where delegates were renewing each others acquaintance. Then there were the little friendly gatherings in the other hotels, at the clubs, and in the theaters. There were trips to the brick plants, not only in Cleveland but to the other cities nearby, all of which was of great interest to those who participated. I was especially pleased to be present at the session when you were presented with the beautiful music cabinet and trust this will give you and your family a great deal of pleasure during the coming years.

Harold Copping,
Kankakee, Ill.



H. J. Flood,
Chicago, Ill.

Harold C. Penfield,
Bucyrus, Ohio.

With best wishes, I am,

Yours sincerely,
GORDON C. KEITH, Secretary,
Canadian National Clay Products Assn.
Toronto, Ont., Canada.

Increased Fee A Good Thing.

Friend Randall, "The Old Reliable":

It gives me pleasure to inclose a two-dollar bill to cover shortage in remittance for payment of dues.

Not until I received your notice, did I know about the change. It is a step in the right direction.

I regret exceedingly that physical disability prevents me from attending the annual meetings.

It's true that your journal gives a correct account of the proceedings, but it is like reading a piece of music without hearing the harmonious sounds.

It did my old heart good to know that the brethren gave you an insight of their appreciation for your many years of untiring and intelligently directed efforts in behalf of the clayworkers of America.

With many kind wishes for you and yours,

I am yours truly,
J. W. McMillan.
Milledgeville, Ga.

The Building Brick Bureau Just What Is Needed.

Dear Mr. Randall:

The last annual convention was a surprise and revelation to me in more ways than one. Each convention which I have attended left me with a pleasant anticipation of more to follow. Ever since I have been actively interested in the clayworking field the annual convention has been a source of much interest to me. Each year there was evidence of a larger attendance and increased interest. These "get-together meetings" give all an opportunity to meet other men who are interested in doing things in a mutual line of work.

The papers which were read at the convention were interesting to me, but I am at a loss to account for the comparatively few in number which attended the regular business meetings, when you take into consideration the number registered and enrolled at this convention. I think it would be interesting to hear from others who attended the convention why the attendance at these meetings was not more. There should be some way of obtaining a larger attendance at these business meetings, which really are the meat of the convention. There is plenty of opportunity for getting acquainted and enjoying the social features of the convention, outside of the hours devoted to business meetings.

The "Building Brick Bureau" project is a step in the right direction. "Preparedness" is the slogan now on every tongue. We should not be slow to recognize that the way to obtain "preparedness" in our line of business is by co-operation and support. The scope of the Building Brick Bureau is just the thing which is needed at this time. We must have an organization which is on the firing line if brick is to be kept in the position which it deserves to occupy at the front. The effectiveness of this organization will be a direct relation to the financial support which it enjoys and also the personnel which will go to make up this organization. Here is an opportunity for the best and biggest talent which we have in the clayworking field, everybody helping.

I hope to be with you next year when you have a bigger, better, and more interesting convention than ever before.

Yours sincerely,
H. C. PENFIELD.

Congratulations on Cleveland Convention.

Mr. Dear Mr. Randall—Enclosed please find check for $2.00 in payment of balance due on membership fee for National Brick Manufacturers Association in accordance with revision in membership fees.

We wish to take this opportunity to congratulate you on the splendid success of our last convention at Cleveland, but would also like to suggest that if our next convention could be held at some time when there were not so many other conventions to bring about the crowded conditions that existed at Cleveland, it would unquestionably add very greatly to the comfort of those in attendance at the brick convention.

With best wishes, I beg to remain,

Very truly yours,
G. B. LUCKETT,
Secretary Crawfordsville Shale Brick Company.
Crawfordsville, Ind.

Thinks Well of the Convention and Its Boosters.

My dear Randall:

I tardily realize that I, as a member of the N. B. M. A., have grown to accept, as a matter of course, your unwearied efforts to make successful—from both a business and pleasure viewpoint—the annual convention of the N. B. M. A.; that for years I have attended, enjoyed and departed, to profit through having been "among those present" at these conventions, without as much as a word of appreciation or congratulation to you. Accept my apology for the unintentional neglect, my assurance of appreciation of your past efforts and my most sincere congratulations upon the successful outcome of the 1916 convention. From the viewpoint of business as well as pleasure I consider it the best convention ever. The full report in the March Clay-Worker is proof positive of this. I hope you will do it again next year. I am glad to pay the additional stipend and consider the membership fee too small at that.

L. E. Rodgers, Zanesville, Ohio.

Very sincerely yours,
Zanesville, O., April 1, 1916. L. E. RODGERS.

Remedy for Lamination.

Editor "Clay-Worker":

I note on page 296, in your March issue of The Clay-Worker, that, referring to lamination, caused either by the die or the auger in a brick machine, Mr. Lovejoy says: You have bad lamination in sewer pipe presses where there is no auger effect whatever. That's very true, but there are many sewer pipe and large tile made that show no lamination. It depends on the clay, it is not the fault of the expressing plunger in the pipe or tile press. The lamination is caused as Mr. Blair says, by the packing of one part of clay upon another part, and this is especially true when the clay contains mica flakes. The tempered clay comes from the wet pan to the elevator and thence to the feed belt and drops in loose, irregular shapes into the clay cylinder and, owing to the clay cylinder being filled up in one operation, these loose, irregular shapes do not unite or interlock, causing lamination. Mica in clay acts like a lubricant, it makes the clay greasy and prevents bonding in the short run to the die.

Such clay needs an extension ring between the clay cylinder and the die, to give the clay a longer run and a chance to bond together, before it reaches the die.

Sometimes an extension ring of 8 to 14 inches will stop the trouble. On the other hand, if quality is the main importance, the clay cylinder could be filled gradually, letting the plunger up and down a few times, to pack each charge until the press is full. This last suggestion, however, I fear, is not timely, as everybody now-a-days is speed mad, from the owners of street cars, automobiles, railroads and steamships to owners of brick machines and sewer pipe presses, but when wrecks and trouble come, they slack down—for awhile, while making an investigation. ANTON VOGT.

Troy, N. Y.

IMMENSE BRICK PLANT FOR MINNEAPOLIS.

The Minnesota Brick Company, of Minneapolis, has been organized to succeed the Minneapolis Clay Brick Company, and a large new plant is to be installed as soon as possible, to be ready to produce brick this summer. A number of large general contractors are interested in the enterprise, including J. L. Robinson, H. N. Leighton and F. G. McMillan, assuring a market for their product. G. E. Luce, engineer for the Illinois Brick Company, of Chicago, has been conducting a series of tests of local clays, at a cost of $15,000, and will have charge of the construction of the plant, which will cost about $400,000. It will be located in northeast Minneapolis, where clays sufficient for many years have been found. The company will make common brick, and anticipates shipping into a wide territory—in fact, as far as the freight rates will permit, this being possibly two hundred miles distant. The company will build a group of six buildings as soon as possible. The plant will have a daily output of 300,000 a day and will have kilns to burn 11,000,000 brick at once. The company has offices in the Plymouth Building in Minneapolis. Some of its advertising has been to urge the general public to use brick rather than other materials, and the efforts being made promise to develop a wider and better market for clay products. It is the intention to make common brick only, and the large production will require the development of something more than the business which has been available.

A CURE FOR THE BLUES.

The current issue of The Book of Smiles is an exceptionally interesting number. There are more smiles to the page in it than usual, even in this clever booklet. Five minutes with this smile producer will sweeten the disposition and prevent ingrowing grouches. The opening item, "A lot of sympathy is handed out to persons who would be benefited far more if they would receive a series of swift kicks," is gospel truth and applies to some very self-important individuals who are blinded by foolish vanity, for which there is not the least excuse. The closing paragraph is a palpable hit, "The most popular after-dinner speaker is the man who says, 'Waiter, give me the check.'" The Book of Smiles is not all fun; there is a leaven of serious thought on drying brick. If you have not received this number write the Standard Dry Kiln Company, Indianapolis, Ind., mentioning The Clay-Worker.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

THE VARIOUS REPRESENTATIVES of the clay products industry in San Francisco pretty generally report a very favorable increase in business in the past month. Weather conditions are right for the commencement of building operations, and, as near as can be surmised at this date, the prospects are for a rather heavy building season. There are but few buildings of special importance announced, but the great number of school houses, fire houses, small municipal and industrial buildings, not to mention a vast amount of residence work, already under way, is having the effect of toning up the brick and terra cotta market in a marked degree. Prices remain firm both on common and pressed brick. Common brick still sells at $7.50 per M. at the yards and $9.00 in San Francisco. Most of the brick plants in the state are now running full force or preparing to do so within the next few weeks. While the year has not been notable for extensive improvements, yet the local agents say the output planned for the season is heavier than usual. The demand for fancy brick is growing fast and the kinds most popular seem to be face brick of the quieter tones. Deep red, buff, gray, cream and sepias are colors that appeal quite generally. Rough finishes are taking well, also, and a few novelties are having a kind of run for the present. The extreme light colors are not as popular as those which show the dirt less. Architects are favoring in their specifications, within certain limits, brick of light and dark shades, which, in construction, give a gentle motley effect. This relieves the monotony of effect as well as gives depth to the wall appearance. Also these varying harmonized shades tend to counteract the disfigurement by dirt and dust. Glazed brick are used somewhat for market exteriors—that is, on fronts—but the bulk of this product is still confined to interior work, largely in restaurants, markets, etc. The fire brick market is brisk and the different manufacturers are confident of a fully normal year. The terra cotta situation has looked up some, with favorable indications of further immediate improvement. Competition is very keen, but as the rival manufacturers of architectural terra cotta all have well established specialties, there is no apparent danger of lowering prices. Polychrome terra cotta is appealing steadily to a wider field. In school building in Oakland some very attractive effects have been accomplished with it on exteriors. The vitrified sewer pipe business is fair, but nothing to boast of. Municipalities, while eager to begin much needed sanitary work, are handicapped by difficulty in disposing of bonds. Vitrified pipe maintains its supremacy as a sewer building material in all but the very largest type of conduits.

The building permits issued during the month of March in the largest California cities showed greatly increased valuation. The permits issued in San Francisco total $2,512,328, which is by far the largest record since March, 1914. Los Angeles, Oakland and San Diego also show most creditable increases.

The San Jose Brick Company will start up its plant on May 1, after the usual winter shut-down. The capacity of this plant is 20,000,000 common brick a season. The company has closed a contract for a million brick for the Spreckels sugar refinery at Spreckels, Cal., and a contract for 300,000 brick for the new high school at Paso Robles.

F. C. Davis, of the Gladding, McBean Company, San Francisco, reports a fair demand for face brick of all kinds. He says that architects show a tendency to use face brick on account of the less cost of maintenance and the superior artistic quality of this building material. Gladding, McBean & Co. also report better business in architectural terra cotta and numerous inquiries from builders. The new business headquarters of this company, on the top floor of the Crocker Building, are a delight to the eye. The entrance-way is adorned with terra cotta jardeniers and settees, and through beveled glass doors one looks directly into the main room, which is likewise beautified by garden seats, vases, pedestals, columns and other classic ornamental products of terra cotta. These ornamental features, for the most part, were taken from the terra cotta exhibit of the company at the exposition.

The McNear Brick Company is busy supplying brick for numerous jobs of more or less importance, among which are two new local schools and two new fire houses.

Mr. Hoyt, of the United Materials Company, says business is good and that conditions promise to be even better by reason of the amount of new building being planned for the summer. This company has just closed a contract to supply a quarter of a million face brick and three-quarters of a million common brick for the new Overland garage at Van Ness avenue and Bush street. Mr. Hoyt reports the red ruffled brick made by the Los Angeles Pressed Brick Company moving well.

The Los Angeles Pressed Brick Company is now starting actual construction work on Plant No. 4, which is located at Alberhill, near Elsinore, Cal. This plant will specialize on fire brick.

Mr. Berg, president of the Port Costa Brick Co., expects to run the yards at capacity for the full season and to produce a fully normal output.

N. Clark & Sons are shipping architectural terra cotta on a number of new jobs of importance, and they are shipping a large quantity of vitrified sewer brick to Stockton to be used in the extensive public sanitary engineering projects now under way in that city. They are also supplying sewer pipe for sewer extensions at San Bruno.

The high price of steel for reinforcing concrete is having a little effect on the local brick trade—for the better—and it may result in a considerable stimulation to the brick business if the price of steel keeps rising.

A merger of the plants of the Pacific Porcelain Ware Company, of Richmond, Cal., and the Western States Pottery Company is under consideration, and the matter is to come up for final decision in a few days. The uniting of these two concerns will mean one of the largest plants of the kind in the West for Richmond.

J. Y. Parker, president and manager of the Long Beach Brick Company, has taken over the plant of the Grand Brick Company, at Santa Barbara, Cal., which has been idle for some time. The new management will make improvements to increase the efficiency of the plant and begin operations immediately.

The McNear Brick Agency is shortly to begin shipping a million brick for the hospital building of the University of California.

San Francisco, Cal., April 5. SUNSET.

A Clay Products Plant for Canal Zone.

Editor The Clay-Worker:

The writer has been referred to you by the Bureau of Foreign and Domestic Commerce.

It is proposed to enter into the manufacture of terra cotta building blocks in the Republic of Panama. Any information you care to furnish would be appreciated, concerning suitable clays, machinery necessary for erection of small plant, data on most approved process of manufacture, and any other suggestions which, in your opinion, would be of value. Kindly advise what standard technical books can be procured treating of the manufacture of terra cotta brick.

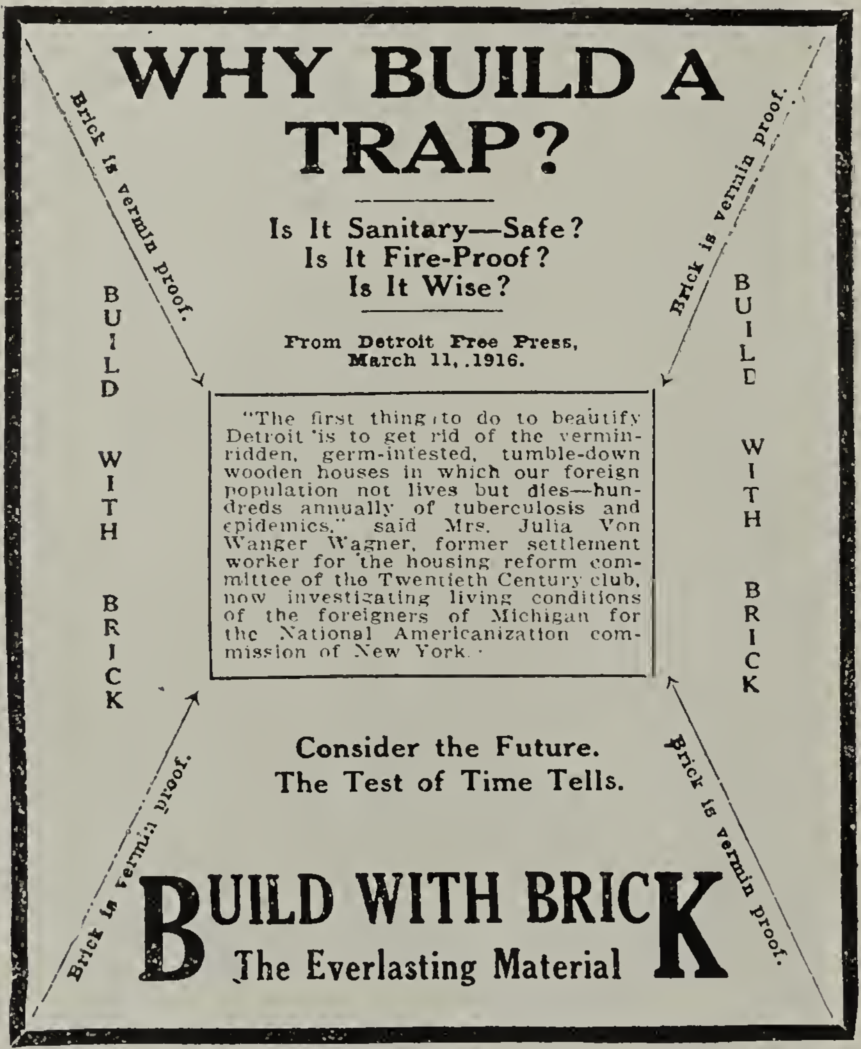
Very truly yours,

Ancon, Canal Zone. L. H. STONE.

BUSY TIMES IN DETROIT.

DUE to the scarcity of labor, manufacturers of common brick in Detroit have granted all brick yard men a substantial increase in wages, the scale now ranging from $3.50 to $5.00 per day. Even at these prices, there is a shortage of labor. The wage increase, together with the increased cost of oil, has set the price of common brick at $9.00 per thousand.

Notwithstanding the price increase, there is no indication of a let up in the outlook of building operations in Detroit; on the contrary, it is already certain that the value of building permits will far exceed the 1915 figures, as each month's business has shown an increase. There are several large structures about to be started, including the skyscraper to be erected by James Couzens, two new hotels, also the possibility of enormous freight sheds and a modern passenger terminal for the Grand Trunk Railroad, not saying anything about the tripling of the capacity of the Ford plant that is now in progress. All of the automobile companies are working a day and night shift, which is partly responsible for the labor shortage on the brickyards.



WHY BUILD A TRAP?

Is It Sanitary—Safe?
Is It Fire-Proof?
Is It Wise?

From Detroit Free Press, March 11, .1916.

"The first thing to do to beautify Detroit is to get rid of the vermin-ridden, germ-infested, tumble-down wooden houses in which our foreign population not lives but dies—hundreds annually of tuberculosis and epidemics," said Mrs. Julia Von Wanger Wagner, former settlement worker for the housing reform committee of the Twentieth Century club, now investigating living conditions of the foreigners of Michigan for the National Americanization commission of New York.

Consider the Future.
The Test of Time Tells.

BUILD WITH BRICK
The Everlasting Material

Four of the larger brick plants in Detroit are now constructing additions to their plants, or building new ones. John S. Haggerty is building a new plant to manufacture twenty million more per year. Mercier-Bryan-Larkin Brick Company are doing likewise. George H. Clippert & Bro. Brick Company are increasing fifteen million a year, and William Clippert ten million a year. All the additional equipment will be ready for operation June 1, which will give Detroit a total output of 400,000,000 common brick per year, all of which, with the exception of a very small percentage, is sold within the boundaries of Wayne county.

William B. Wreford, manager of the Detroit Brick Manufacturers and Dealers Association, is continuing his good work of boosting the "Build with Brick" campaign, his latest ad, which appeared in all the recent daily papers of Detroit, is given herewith.

INCREASE IN THE FAMILY OF THE DUNN WIRE-CUT-LUG BRICK CO.

The latest addition to the family of licensees of the Dunn Wire-Cut-Lug Brick Company is the Indiana Paving Brick and Block Co., of Brazil, Ind. This makes the total number of licensees twenty-nine, with forty-six plants producing millions of the Dunn wire-cut-lug brick. The Indiana company has been in business for many years and has a high standing in the paving brick industry. If such had not been the case they would never have been granted the right to make lug brick, for the licensors are very careful to keep the product up to a high standard. The present licensed manufacturers are: Corry Brick & Tile Co., Corry, Pa.; United Brick Co., Greensburg, Pa.; Sterling Brick Co., Olean, N. Y.; Reynoldsville Brick & Tile Co., Reynoldsville, Pa.; Danville Brick Co., Danville, Ill.; Clinton Paving Brick Co., Clinton, Ind.; Alton Brick Co., Alton, Ill.; Medal Paving Brick Co., Cleveland, Ohio; Metropolitan Paving Brick Co., Canton, Ohio; Bessemer Limestone Co., Youngstown, Ohio; Peebles Paving Brick Co., Portsmouth, Ohio; Murphysboro Paving Brick Co., Murphysboro, Ill.; Southern Clay Manufacturing Co., Chattanooga, Tenn.; McAvoy Vitrified Brick Co., Philadelphia, Pa.; Windsor Brick Co., Akron, Ohio; Hocking Valley Brick Co., Columbus, Ohio; Veedersburg Paver Co., Veedersburg, Ind.; Springfield Paving Brick Co., Springfield, Ill.; Terre Haute Vitrified Brick Co., Terre Haute, Ind.; Albion Brick Co., Albion, Ill.; Alliance Clay Products Co., Alliance, Ohio; Westport Paving Brick Co., Baltimore, Md.; Mack Manufacturing Co., New Cumberland, W. Va.; Hydraulic-Press Brick Co., St. Louis, Mo.; Barr Clay Co., Streator, Ill.; Burton-Townsend Co., Zanesville, Ohio; Trimble Paving Brick Co., Dayton, Ohio; Thornton Fire Brick Co., Clarksburg, W. Va.; Indiana Paving Brick & Block Co., Brazil, Ind.

HOOK PATENT KILN FINDS FAVOR.

It gives us great pleasure in saying that the N. B. M. A. at their meeting in Cleveland, O., has made a lasting impression upon its members, and by bringing "Fellow Craftsmen" thus together, having all the latest improvements explained in detail, showing advantages they have over old methods, can't help but increase output, reduce cost, lighten labor, and offer contractors and builders an article of superior quality, at a moderate cost. "Ware Fit For a King."

We never before had experienced such enthusiasm as was manifest at the convention this year. Meeting men from almost every state in the Union and the Dominion of Canada. Whose very heart and soul were enlarged by the many, many new ideas in the manufacture of their products, and same modern devices only putting into effect theories advocated by themselves for years. At last recognizing the fact that "Progression is our 'motto,' new things have come to stay, but we can make 'face brick' no longer in the good old fashioned way."

And the companies represented by salesmen at the convention join with us in saying that business is better than ever before. While the Ohio Kiln Co. has been in the field but a short two years, it is enjoying the pleasure of receiving good reports from its up and down draft kiln, from Mars, Pa., in the east, to Seattle, Wash., in the west. And it is displacing the common down draft kiln for the same reason the mowing machine and "self-binder" have displaced the old scythe and "table rake," greater efficiency and economy.

At Mars, Pa., where Mr. Chris. Gelbach was recently elect-er president, the Improved Hook Patent Up and Down Draft system is in use, and Mr. Gilbach writes: "We are changing our other kilns as the up and down draft has every advantage over them."

The Anders Shale Brick Co., of Cincinnati, O., has contracted for five new 30-foot kilns of the up and down draft type. When the Ohio Kiln Company representative first called on them the plot was made to use six common down draft kiln, but after showing them where five of our type would do the same work, they immediately began excavating and have one almost completed.

EL PASO BREAKS RECORD FOR NEW BUILDINGS.

Notwithstanding the fact that El Paso, Texas, is close to the trouble zone, it is enjoying a very prosperous building season. In fact, it has broken the building record for the first three months of 1916, and be it known, El Paso is a brick city. There are four brick plants in the city and they are all running to capacity and expect to continue to do so indefinitely.

BRICK TRUCK WANTED.

A reader of The Clay-Worker desires information in regard to a truck for the conveying of pallets and brick from machine to dryer yard. A truck that will carry a number of pallets loaded with brick depositing same on dry floor in rows is what is wanted. Makers or dealers of such trucks are requested to address "Hawk," care Clay-Worker.

A NEW BRICK DRYER.

Something new in the way of a brick dryer is the invention of F. W. Dennis, Norfolk, Va., who is known to the readers of The Clay-Worker and the trade in general as the inventor and builder of the Dennis kiln. The dryer is quite different from anything heretofore introduced. The brick are placed on steel pallets and handled by lift cars. By this new system there is a saving of time, labor and fuel and there is no investment for dry cars or expense for the upkeep of same. Mr. Dennis will be pleased to give full particulars to any reader desiring further information. See ad on page —.

AMERICAN COAL PRODUCTS COMPANY CHANGES NAME TO THE BARRETT COMPANY.

It is announced that the American Coal Products Company and the Barrett Manufacturing Company have decided to unite the good-will and high reputation of both concerns under the name of The Barrett Company.

The American Coal Products Company is well known in connection with the sale of Sulphate of Ammonia, and heretofore owned the stock of the Barrett Manufacturing Company.

The fact that all the coal tar chemicals, disinfectants, roofing, waterproofing, road-making and wood preserving materials have been made and widely advertised in the name of the Barrett Manufacturing Company has added immensely to the good-will attached to the Barrett name. This increase, however, has not been connected in the minds of the general public with the securities of the American Coal Products Company.

The new company will have the same amount of stock as the American Coal Products Company and the change in name will be accomplished by exchanging the outstanding certificates share for share.

Some of the widely advertised trade-marks of the Barrett Manufacturing Company will be recognized in Barrett Specification Roofing, Tarvia, for roads, and Congoleum floor coverings—the latter being manufactured and distributed by The Congoleum Company department of The Barrett Company.

The products of the chemical department of The Barrett Company are receiving particular attention at this time, due to the European situation, and it is expected that this branch of the business will be of larger importance hereafter, as the advantage of an American source of supply will doubtless appeal to users of these products in this country.

The Barrett Company in this department has produced for many years pure (natural) carbolic acid, cresylic acid, refined naphthaline (in various forms), benzol, toluol, etc., in addition to which they also now manufacture considerable quantities of synthetic carbolic acid (phenol).

CLAY BLASTING.

The E. I. Du Pont De Nemours & Company, of Wilmington, Delaware, has just had printed a Clay Blasting Booklet. As it is the first booklet ever issued on this subject it contains valuable and interesting information. Some of the phases covered are "Digging Clay," "Stripping," "Blasting Down Shale," "Digging Plastic Clays," "Mining Flint Clays," "Draining Clay Pits," as well as full information on the use of explosives.

The booklet will be sent to any address upon request.

SERIOUS ACCIDENT AT THE MAYER BRICK PLANT.

C. P. Mayer Brick Company Works was the scene of a very serious accident, March 13, when Dominic Meali was probably fatally injured by a powder explosion. Meali was foreman of the clay bank crew and had charge of blasting. He sprung an eighteen-foot hole with dynamite for the purpost of making a pocket in which he intended to place the final charge of powder. It appears that he did not wait, as usual, until the pocket could become cool after the charge was exploded, but poured powder into the hole from a twenty-five pound keg of black powder. In the explosion which followed, his hands and face were badly burned, and he was immediately taken to the West Penn Hospital. He will probably lose both eyes and may be scarred. Mr. Meali has been in the employ of the C. P. Mayer Brick Company at Bridgeville, Pa., for twelve years and this accident is greatly deplored by them.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., required by the act of Congress of August 24, 1912, of The Clay-Worker, published monthly at Indianapolis, Ind., for April 1, 1916.

State of Indiana, County of Marion, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared Theodore A. Randall, who, having been duly sworn according to law, deposes and says that he is the editor of The Clay-Worker, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, T. A. Randall & Co., Inc., Indianapolis, Ind.
Editor, Theodore A. Randall, Indianapolis, Ind.
Managing editor, Theodore A. Randall, Indianapolis, Ind.
Business manager, Theodore A. Randall, Indianapolis, Ind.

Owners are T. A. Randall & Co., Inc., Indianapolis, Ind.; Theodore A. Randall, James E. Randall and Denton F. Billingsley, each and all of whom are at 211 Hudson St., Indianapolis, Ind.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

That the two paragraphs next above, giving the names of the owners, stockholders, security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) Theodore A. Randall, Editor.

Sworn to and subscribed before me this 28th day of March, 1916.

(Signed) Walter P. Hanna, Notary Public.

[Seal] My commission expires April 4, 1916.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., required by the act of Congress of August 24, 1912, of THE CLAY-WORKER, published monthly at Indianapolis, Ind., for April 1, 1916.

Name of Editor and Business Manager, Theodore A. Randall, Indianapolis, Ind.

Assistant Editor, James E. Randall, Indianapolis, Ind.

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Vol. LXV. APRIL, 1916. No. 4.

CURRENT COMMENT.

Let "Help Ye One Another" be the battle cry of the clayworkers.

* * *

Be active in local advertising and make conspicuous the injunction to Build with Brick.

* * *

Preparedness, push and profits should be the big words in the lexicon of the brickmakers this season.

* * *

Remind prospective builders that burned clay makes the best porch floor as well as the best foundation, piers and parapet walls.

* * *

One of the things every brick man should be prepared for is to furnish specific data on the cost of brick building when prospective builders come asking for it.

* * *

A typewriter has been invented with an eraser attachment. This man, like many an inventor, has got the wrong idea. What we need is an attachment that will spank the operator every time an error is made, then there won't be much need for an eraser.

* * *

Some folks are so blamed bent on being efficient that they are forgetting how to be human.

* * *

With the ball season and the building season both open now every man can be a rooter of some sort.

* * *

The better roads movement is moving along very nicely and the country prospers more in consequence.

* * *

One of the good things our soldiers have given Mexico some samples of, is real money—a thing they seem to need and should appreciate.

* * *

Practically everything used in building operations except brick has advanced materially in price, so brick ought to be in high favor and also bring a better price.

* * *

It is a good idea for the brick man to set a goal for his year's work and then strive to attain it. Figure out in advance how many brick you intend to make, then go to it.

* * *

County commissioners as well as city fathers are learning something of the benefits of the brick-paved roadway, and they are realizing that in road making the best brick is the cheapest in the end.

* * *

The average price of paving brick in 1914 was $13.42, so the man who sells pavers these days should keep his eye on that average even though he may figure he is so favorably fixed that he can make them for less.

* * *

The clayworking industry has profited a lot from studying the mechanical and scientific side of the work and now it may also profit from a study of the commercial side because there is evident need of more boosting and better prices.

* * *

The cast iron pipe people seem to have gotten the inside edge on our sewer pipe people in the framing of many building codes. There are a number of lost trenches there that might well be regained for the vitrified clay pipe, and it seems up to the trade to wage both a defensive and an offensive campaign because when it comes to drainage underground there is nothing superior to the vitrified pipe.

* * *

The Forest Products Laboratory is actively co-operating with lumber people in making models to show various uses of wood. This in a way is assisting in the exploitation of wood and if the Forest Products branch of the government can do this the Geological Survey may well lend a hand and assist the clayworking industry along the same lines, that of showing the uses that can be made of burned clay products.

THE EASTER SEASON.

Easter is the one annual day of celebration, which because of the difference in length between the moon periods and the months of the calendar, is movable. By general agreement, customs and rules, Easter is celebrated on the first Sunday following the first full moon after the 21st of March. Easter marked, in old traditions and folk-lore, the beginning of a new year in agriculture in the northern half of the world and just as it marks the dawn of a new year for the things that grow in the ground so does it also mark a beginning of a new year in building operations for the northern part of the country. Therefore, while religiously, it is characterized as marking the ascension of Christ, in tradition and folk-lore it marks the day when the sun returning northward overcomes the cold and makes the earth bring forth its next crop for mankind. The period or season preceding Easter is given over in religious circles to some measure of fasting and sacrifice, and in clayworking circles it is often given over to preparation in another way for the coming season—to the installation of new machinery, the reorganizing of the plant and getting ready for a busy season ahead. The extent of the getting ready and preparations is usually gauged in a measure by the outlook ahead and prospects for the expansion of business. This year the outlook is so cheerful that there has been an unusual amount of preparation providing new machinery and refitting and putting plants in order for bigger business. This indication has brightened, as Easter approaches too, and at this writing the prospects are that the season as a whole will be a very bright one in the history of the clayworking industry. So we may well go forward confidently and cheerfully because as the earth brightens up and the busy building season approaches there is evidence that there will be plenty of work for all and a measure of prosperity throughout the country that has perhaps never been known before.

CONCRETE EXPANDS MOST IN WINTER.

Measurements taken by the Bureau of Standards has established beyond question the fact that contrary to the generally accepted opinion concrete does most of its expanding in the winter time instead of during the hot days of summer. This is because in the winter there is more moisture absorbed by the concrete which expands with freezing weather, whereas in the summer time it dries out under the heat of the sun, causing contraction. So concrete pavement really expands in damp freezing weather because of the moisture content and do their contracting in hot dry weather when steel, brick and other non-absorbent materials expand.

CERAMIC WARE FROM JAPAN.

Among the things captured from Germany by Japan as a result of the war in Europe is the larger part of our import trade in ceramic ware. During the past year Japan has shipped us many goods of this class formerly supplied by Germany and the result has been to increase the exports of Japanese ceramic ware from 40 per cent. of that manufactured to more than 70 per cent. The line in which they are doing the biggest trade with this country is coffee cups, electrical supplies, toys and cheap products that they are able to manufacture and sell here in competition with such ware manufactured in this country. A report from vice-counsel E. H. Dooman, of Kobe, Japan, indicates that the Japanese have accepted many contracts from the United States at such low figures that they have been compelled to change from hand labor to machine labor and also to adapt more modern kilns and use coal. At the same time the cost of kaolin has increased, wages have risen and it is said the manufacturers of goods for export to the United States have been pretty badly bit and their one hope for profit is to perfect manufacture on a large scale with modern macnines. They are exerting themselves to so improve their methods and reduce the cost that they may be able to hold this trade against Germany even when the war ends. Meantime it is probable that our own manufacturers here in the United States will make some progress too and have something to say about the trade.

THE WAR ON CHEAP BUILDING.

It is refreshing to note that some of the contractors' exchanges and master builders' associations are starting in to wage war on cheap, flimsy building construction. An illustrative instance of this kind is furnished by one of the monthly letters of the Master Builders' Association of Boston. Among other things, this letter says that in the business of building society has made extended inquiries for cheap prices, and that it seems no other consideration need apply. Then at considerable length it is pointed out how insidiously harmful this pursuit of the low prices has bceome. It is not only harmful to building contractors by begetting an unhealthy order of competition, but in the end it hurts the man who has done the building, because when he gets it he has a poor order of construction and a bad investment. He would be much better off to pay the right kind of a price and insist upon a good building. The contrast is pointed between the attitude of a man when he goes to build a house and when the same man goes to buy food, clothes and other things. When a man buys a hat he knows he can get a cheaper hat, but he also knows that it will be inferior, and the discriminating man, in selecting hats, clothes, food and most of the other things of life, will pay the price to get a desirable quality. Yet when it comes to building operations the dominating idea seems to be that of trying to get work done at as low cost as possible. The brick manufacturers of the country should join heartily in this war against low-priced building, because it is one of the things that has been a bar to the progress of brick and the doing of better building. Many a builder has shied at the additional cost of 10 or 15 per cent for building his walls with brick and has accepted more flimsy construction to save in first cost, yet he has had to pay up for it in lack of premanency. Better building means brick building, and a successful war against that order of ruinous competition between contractors that leads to flimsy, cheap building, will mean quite a lot to the future of the brick business; also to the welfare of building contractors all over the country. So The Clay-Worker not only commends the efforts of those builders' exchanges and master builders' associations who are waging a war of this kind, but desires to bespeak for them the co-operation of the clayworking industry.

SAND-LIME BRICK REVIVES.

There is some evidence of revival of the sand-lime brick industry, as shown by the report of the U. S. Geological Survey, which will be forthcoming in a short time. The total production for 1915 was 179,643,000 brick, valued at $1,135,104. This was an increase of 4 per cent in quantity and 7 per cent in value, as compared to 1914. When we consider that this increase took place during a comparatively dull year, it is some indication of new life and a marked revival in an industry which has been through some very trying times, due partly to unwise promotion in many instances that led to the establishing of plants where conditions were not favorable. It suggests that the industry is getting on a sounder basis and in shape to develop a healthy growth that will be steady and dependable. Michigan is the leading state, and produced over one-quarter of the total quantity of sand-lime brick, with Minnesota in second place and New York third. The report indicates, too, that many plants are being enlarged and put in better shape, so that a larger increase in the production is anticpated for 1916.

FOOD FOR THOUGHT.

There is food for earnest thought in some statements made by Edward N. Hurley, of the Federal Trade Commission in an address before the Boston Commercial Club.

In describing the propositions of government co-operation with the business interest of the country for which the Federal Trade Commission was created Mr. Hurley set forth some startling facts that were developed from a year of investigation by the Federal Trade Commission. Among the things said by him that contain food for serious thought we find the following:

"Groups of business men are constantly coming before the Federal Trade Commission, asking for information as to how they can improve conditions. Manufacturers come to us pro-testing against overproduction or complaining against their competitors, claiming unfair methods of competition and asking us for relief. They assert their competitors are selling goods below cost and ruining the industry in which they are engaged. For these evils, often of many year's standing, they request relief.

"The Federal Trade Commission has been in existence one year and after surveying the field we found from a preliminary investigation that 200,000 corporations out of a total of 260,000 engaged in the manufacturing and mercantile business of the United States were eking out an existence; 100,000 of them did not earn a penny. Out of 60,000 successful corporations doing a business of $100,000 a year over 30,000 charged off no depreciation whatever. Only 10 per cent. of our manufacturers and merchants know the actual cost to manufacture and sell their products: 40 per cent. estimate what their costs are, and 50 per cent. have no method but price their goods arbitrarily. Most of the manufacturers and merchants who do not know what their goods cost are basing their selling price on what their competitors sell for and with only this knowledge for a basis they are frequently cutting prices and demoralizing the industry in which they are engaged."

There are some pretty hot shots here for our boasted business integrity and Yankee shrewdness, and while the shot scatters and hits many lines of industry a part of it certainly lands strongly on the brick trade. Brick manufacturers have too long sacrificed their profits by competing one with the other and not putting enough price on their product or enough backbone behind their selling propaganda.

The only way the government can do much good is to point out errors and assist the trade in helping itself. It is up to the industry to get together and mend its own ways, and with the government offering to co-operate instead of antagonizing things of this kind, as it has in times gone by, we should need no other encouragement for that kind of getting together that means better profits and a bigger business generally.

THE BOSS TEN-HOUR UNIT-CONTROL DRYER.

An interesting booklet telling of the merits of the Boss brick drying and burning system has been received from the John C. Boss Co., Elkhart, Ind. Among the chief merits claimed is that by this system there is no loss from checking or cracking, and the brick are free from whitewash or other stains. The Boss pallet system is illustrated and the book contains other information of interest to building brick manufacturers. A copy will be mailed to readers of The Clay-Worker on application.

TELEGRAPHIC CODE FOR FACE BRICK MANUFACTURERS.

The advent of the Day Letter introduced by the Western Union Telegraph Company was a decided help to those who have to use the wire in the regular course of business. Supplementing the Day Letter and to meet the diplomatic requirements of business communications, the American Face Brick Association has issued a telegraph code book and is offering same to the trade at $1.00 per copy. For full particulars, address R. D. T. Hollowell, secretary American Face Brick Association, Fulton Building, Pittsburg, Pa.

EXPERT CERAMIST ESTABLISHES HEADQUARTERS AT PERTH AMBOY, N. J.

Herman Plusch, of Perth Amboy, N. J., for many years connected with the Atlantic Terra Cotta Company as chief chemist, has severed his connection with that company and embarked in business for himself as a consulting ceramic chemist. Mr. Plusch has had a wide experience in clayworking and is recognized as an authority in clay glazing and enameling. He was the first to successfully produce a red glaze for use in architectural terra cotta, and the famous McAlpin grill in New York, is an example of his handiwork. Brick and tile manufacturers desiring the service of an expert in such work are requested to correspond with him.

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PURINGTON PAVING BRICK COMPANY TO PUBLISH PAPER.

With the opening of the Purington Paving Brick Co. plant, Galesburg, Ill., for the year a new feature has been inaugurated. This is a paper called "Purington News," edited by the company. The purpose of this paper is to keep the employees of the yards in touch with what goes on and to interest them in their work. It is a monthly edition.

TRADE NOTES.

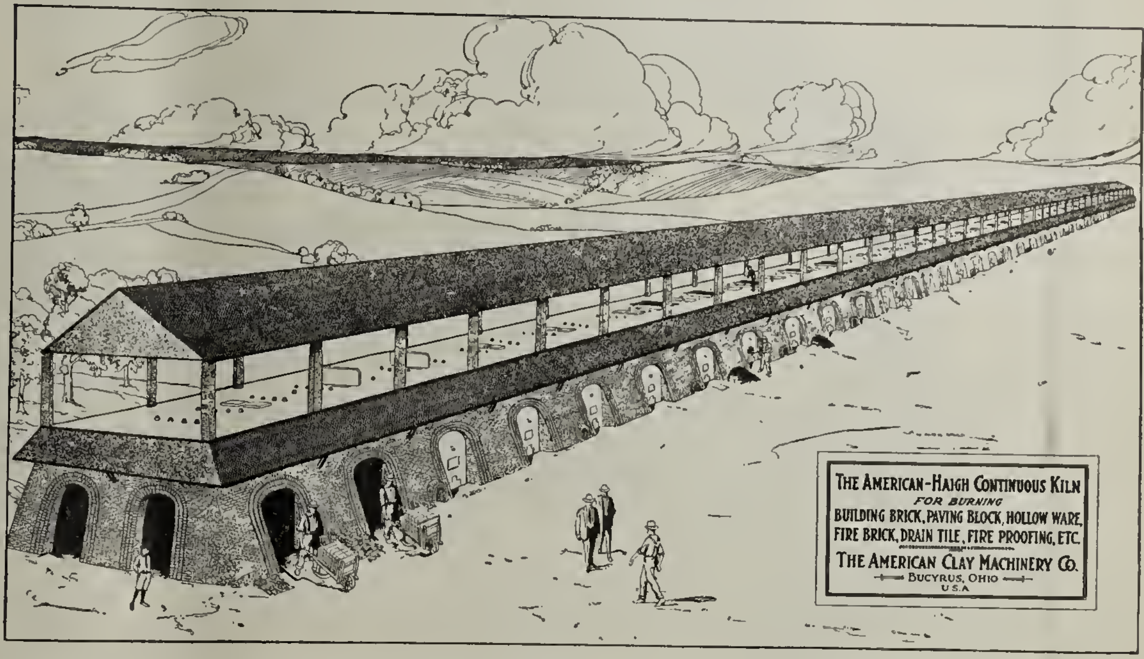
Charles M. Crook, of Catskill, N. Y., has secured a sixty-day option on a tract of land at Hornell, N. Y., containing a fine deposit of shale, with a view of erecting a large paving brick plant on same. Mr. Crook is a past master in the building and operation of paving brick plants and will without question make a success of the enterprise.

The Conard-Hallwood Brick and Tile Company, of Columbus, Ohio, has been incorporated with $15,000 capital stock. The incorporators are John A. and John B. Conard, Henry S. Hallwood, Annie Hallwood and John W. Wilson. The company will manufacture shale brick and hollow tile and will eventually turn out 100,000 brick per day.

George Keys, a burner on the night shift at the American Brick and Tile Company's factory at Mason City, Iowa, was electrocuted recently while working about some high tension wires at the power house. The exact cause of his death is not known, but Keys had gone into the power house to see if he could remedy some difficulty which had put the plant in darkness. He was dead when found by his fellow workmen.

Frederick W. Donahoe has been appointed secretary of The Refractories Manufacturers Association, taking the place of Francis N. Woodman, resigned. The new association offices have been opened in Chicago, at 220 South Michigan avenue.

THE KILN TO MAKE YOUR PRODUCT FAMOUS


The American-Haigh Continuous Kiln
for burning
Building Brick, Paving Block, Hollow Ware, Fire Brick, Drain Tile, Fire Proofing, Etc.
The American Clay Machinery Co.
Bucyrus, Ohio
U.S.A.

Just the other day a brick manufacturer wrote us that the Haigh Kiln we installed for him had carried him over the panic and not only saved him loss but made it possible for him to pay a dividend.

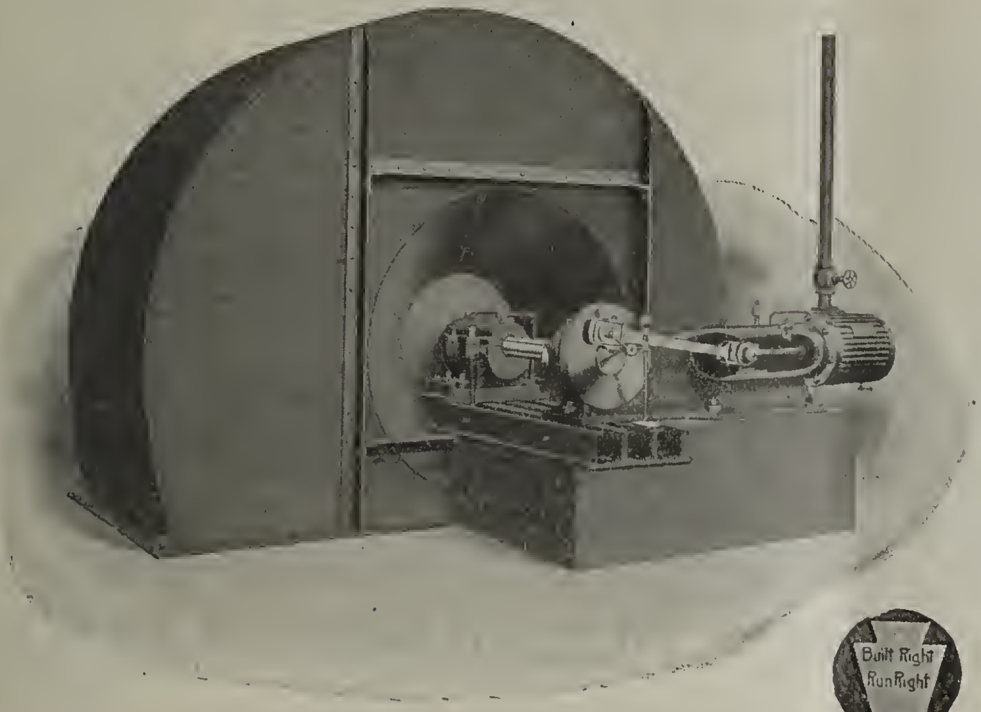
He said the Haigh Kiln improved his quality to such an extent that it extended his market over a wider selling territory and the saving in burning cost effected by the Haigh Kiln had given him such a margin that he could deliver his brick at a greater distance and beat the other fellow on price.

Here's the real point. The Haigh Kiln IMPROVES QUALITY and it CUTS THE COST. Wouldn't that help you? You can install the Haigh Kiln and it will pay for itself, leaving you all the advantage without cost. Let us tell you more about it.

Built Right Run Right

SAVE THE KILN WASTE

Besides the saving of half your fuel which the Haigh Kiln effects, you can make still more of a saving by using the waste heat from the kiln to dry your product.



Our Waste Heat Dryer is one of the possible economies by the use of which you can increase the quality of your product, increase the capacity of your plant and increase your bank balance.

Our Waste Heat Dryer Catalogue will interest you. Its yours for the asking. It tells the story and points the moral.

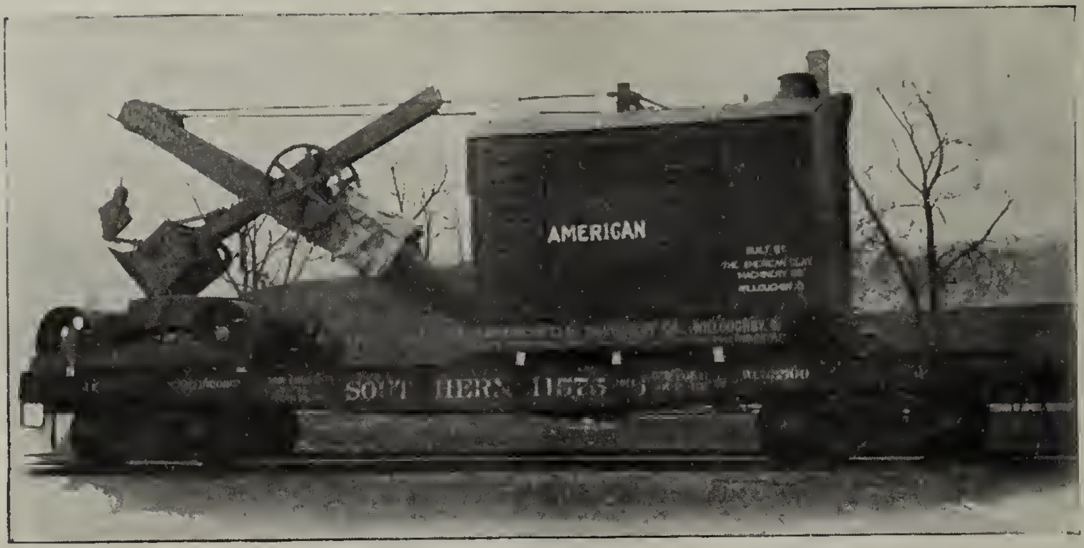
There is nothing the clayworker needs which we do not furnish.

Built Right Run Right

The American Clay Machinery Co.
Bucyrus, Ohio

Much the Largest Manufacturers of Clayworking Machinery in the World.

LOADED FOR IMMEDIATE SHIPMENT



We have anticipated the heavy spring trade and have these machines in stock.

A strong, durable steam shovel. Not a light machine, with an oversize dipper, but a 20 Ton Machine.

Designed and built throughout for a ⅞-yard dipper. It has the WEIGHT and STRENGTH to do its work—eliminating the high maintenance cost that always goes with a light shovel.

A heavy machine with a light price—the

American ⅞-Yd.

The Steam Shovel for Your Job

Rigged with a BUCKET, for grading and excavating; with CLAM SHELL or ORANGE PEEL for the deep digging; with CRANE for the hoisting.

ONE MACHINE and ONE OPERATOR for the grading, deep digging and hoisting. Saves even more in operation than it does in first cost.

Let us tell it all.

Here is an opportunity to get a steam shovel BUILT TO STAND UP, at a price that is LOW, and get it at once.

The more you know about the machine, the better you will like our proposition.

Write for our new catalog.

Built Right Run Right

The American Clay Machinery Co.

Bucyrus, Ohio. Steam Shovel Department

Bucyrus is on the Lincoln Highway and We Are Paving It With Brick.

Much the Largest Manufacturers of Clayworking Machinery in the World.

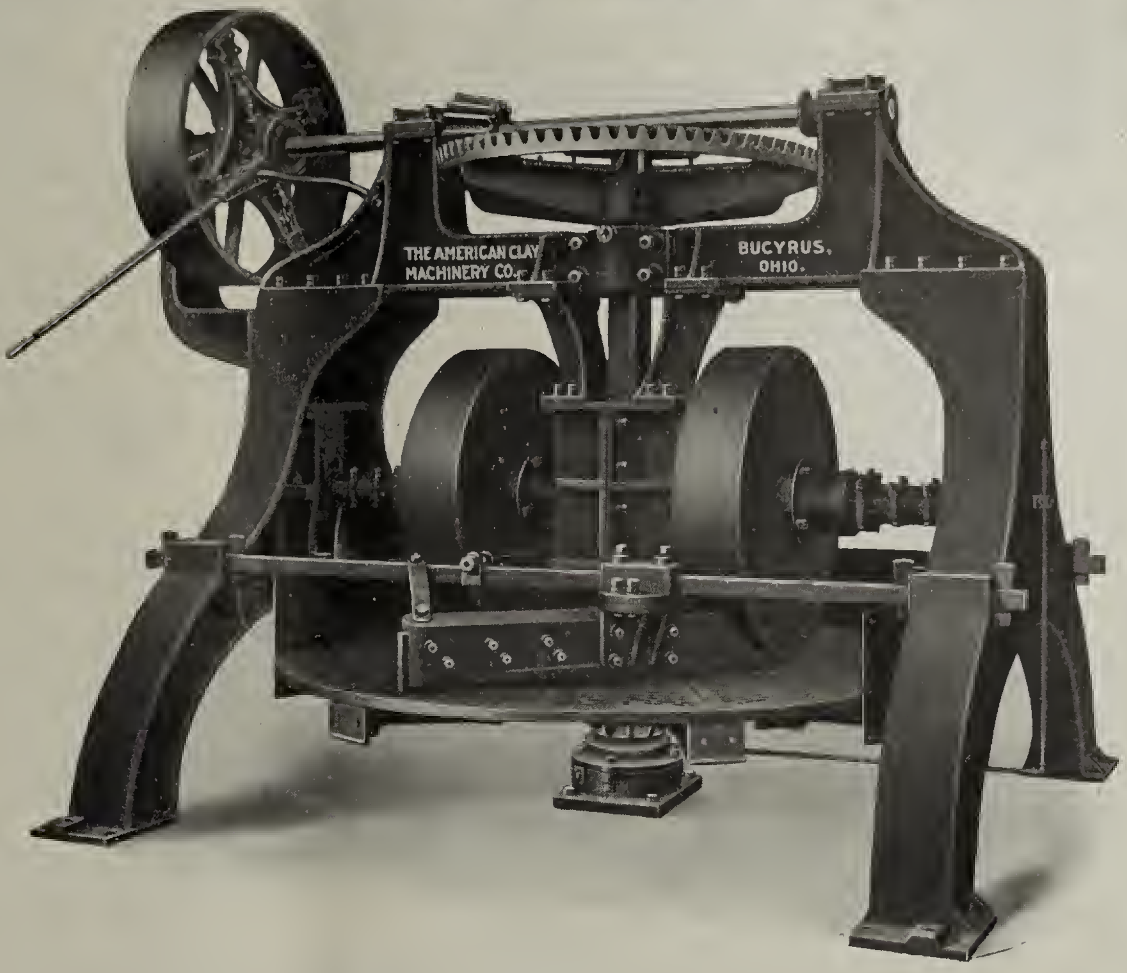
A CAPACITY DRY PAN

Dry pans look pretty much alike, but they differ in operation in proportion to their designing and building.

The American Pans are "Built Right and Run Right."

In design they are absolutely right, being benefitted by 50 years of clay machinery experience.

In satisfactory operation and capacity they are the best on the market, as users everywhere will tell you. Let us send you complete descriptions on all our Dry and Wet Pans. This bulletin will interest you, because it gives complete specifications with illustrations.



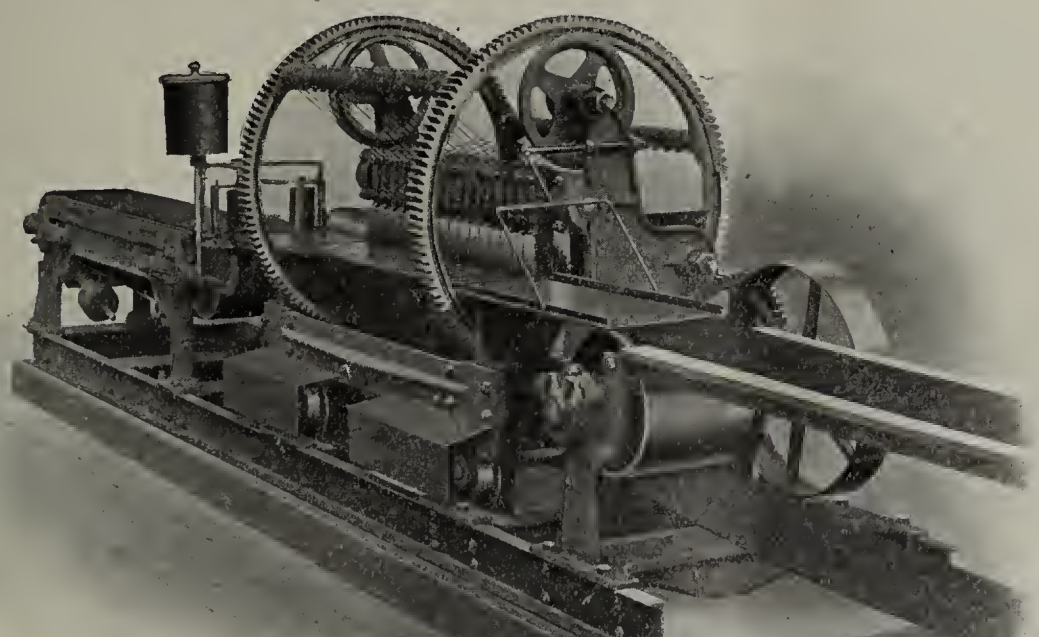
American 9 Foot and 8 Foot Dry Pan.

Don't underestimate what our Nine Foot Pan will do, or you may have to speed up your whole plant to take care of the pan output. We have pans of all capacities and can meet your need.

THE AMERICAN AUTOMATIC CUTTERS are a line of dependable cutters. They are sold under the "Built Right Run Right" label, and can be depended upon to produce satisfactory results. They are carefully built, of best material by competent, life-long cutter builders.

Let us send you detailed specfication sheet of the American No. 342. Its the peer of all cutters.

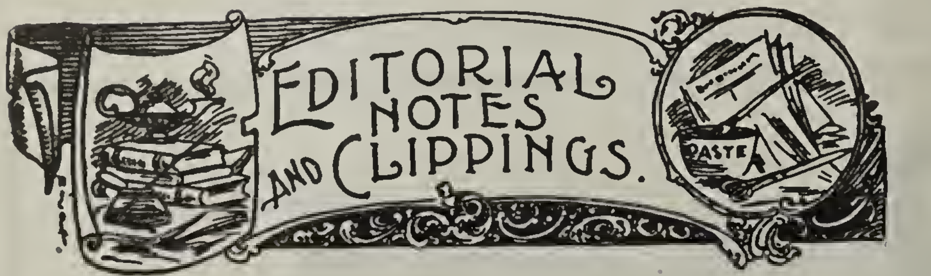
We make everything for the Clay Plant—be it big or little.



American No. 342 Rotary Automatic Cutter

The American Clay Mach. Co., Bucyrus, Ohio

Bucyrus is on the Lincoln Highway and We Are Paving It With Brick.



EDITORIAL NOTES AND CLIPPINGS.

The Wheeling Tile Company, Wheeling, W. Va., will spend $12,000 on an addition to the plant.

Clyde C. Fries has purchased the plant of the Bloomdale Tile & Brick Company, at Bloomdale, Ohio.

The Southern Tile & Brick Works at Jackson, Tenn., will enlarge its plant to produce 20,000 fire brick daily.

The Oskaloosa Vitrified Brick Co. will issue $50,000 bonds for enlarging and improving its plant at Oskaloosa, Iowa.

J. McKinnon is making arrangements to erect a small brick plant at Ignacio, Colo.

C. M. Groves, of Hudson, Wyoming, writes that he is in the market for a stiff mud brick machine with automatic cut off.

The Postville Clay Products Company, of Postville, Iowa, has filed a certificate increasing their capital stock to $150,000. $150,000.

J. E. Eckerson, owner of extensive brick yard properties in Haverstraw, N. Y., died quite suddenly at his home in Englewood, N. J., April 7.

The Louisville Fire Brick Company, of Louisville, Ky., will make extensive additions to its plant for the purpose of increasing its daily capacity to $45,000 fire brick.

The Bloomfield Brick Company, Bloomfield, Ind., write they are in the market for steel or cast iron dryer cars. They also have a second-hand Raymond repress machine for sale.

Cyrus Hash, an employe of the Bloomfield Brick Co., Bloomfield, Ind., was accidentally caught in the brick cutting machine and both of his arms broken before he was extricated.

The Hillenbrand Brick Company, of Louisville, Ky., has been incorporated with $12,000 capital stock. Those interested are Andrew P. Hillenbrand, Oscar Hillenbrand and Carl Hillenbrand.

The Camden Coal and Clay Company, at Camden, Ark., reports that business has been exceptionally good this last season. The company is now shipping hundreds of carloads of clay to manufacturers in the east.

Extensive improvements, which will cost in the neighborhood of $60,000, are now under way at the two plants of Hiram Swank's Sons, at Johnstown, Pa., which will increase the capacity of the plants about 25 per cent.

The Georgia Red Brick Company, of Pooler, Ga., has started its plant after having been idle for nearly two years. The demand for brick has increased to such an extent that the plant will be run night and day for a while to catch up with their orders.

The secretary of state has issued a charter to the Columbia Clay Company, of Columbia, S. C., with a capital stock of $200,000. The company will do a general brick and tile manufacturing business. The plant of the company is located near Eau Claire.

E. M. Wise, assistant superintendent of the Vigo-American Clay Company, at Terre Haute, has resigned his position with that company and will in the future be associated with the Roanoke Clay Company, of Roanoke, Ill. Mr. Wise will be succeeded by William Snedden, of the Brazil Clay Company.

Any one looking for a bargain in the way of a brick plant will do well to investigate the plant offered for sale by Anson G. Betts & Co., of Asheville, N. C. The plant which is located at Hot Springs, N. C., is equipped throughout with first-class machinery and is comparatively new, having been run less than two months. The plant will be sold either in whole or in part.

A company has been organized with $25,000 capital stock to take over the plant of the Glendon Brick and Tile Works, at Glendon, Iowa. Work of enlarging and improving the plant will be started at once and will include the installation of a new dryer and two new kilns. The president of the company is Bert Clay; secretary, W. F. Moore; treasurer, Chas. Wells. The company will also erect houses near the plant for their employes.

Geo. Saffert and Wm. Gugisberg, of Gibbon, Minn., have under way plans for the establishment of a tile plant at Duluth, Minn.

The Wallaceburg Brick Company of Wallaceburg, Ontario, Canada, is in the market for a single cylinder, 50-horsepower stationary natural gas engine.

The Manufacturers Equipment Company, of Dayton, O., is now installing the Underwood burning system at the Ohio Clay Product Co., at Salineville, O.

The Star Clay Products Company, San Antonio, has increased its capital stock from $100,000 to $150,000, and will enlarge its brick and tile manufacturing plant.

W. J. Rossman, formerly of Huron, S. D., has purchased the interest of Edward Klopping in the Yankton Brick & Tile Co., at Yankton, S. D., and will take over the management of the plant.

W. L. Van Deman & Co., 176 West Central street, Delaware, Ohio, writes that he desires to correspond with manufacturers of light, white or light mottled paving or face brick in Ohio and nearby states.

William S. Hedden, of Fairhope, Ala., advises us that a company has recently been incorporated at that place for the manufacture of brick, tile and hollow ware and that they are now on the market for a steam shovel.

The Mo-Ho Brick Company, of Mount Holly, N. C., has been organized with $15,000 capital stock. George D. Jenkins is at the head of the concern which will manufacture and deal in brick and other building materials.

William McDonald has filed suit against the Indiana Paving Brick and Block Company, of Brazil, Ind., for $2,000, for injuries sustained while in the employ of that company. One of his hands having been seriously injured in a machine.

The plant of the Riverside Brick Company, at Charlotte, N. C., was almost totally destroyed by fire the latter part of March. The flames started in the roof of an overheated kiln and spread rapidly to other parts of the plant. The company will rebuild.

The Thornton Fire Brick Company, Thornton, W. Va., recently booked an order for a million and a half of their paving block to be used in the construction of roads in Monongalia county. This county is doing a lot of improvement in its highways in which brick occupies a prominent place.

William Fenner, engineer at the factory of the H. H. Hallatt Brick & Tile Company, Tilbury, Ontario, Can., was killed April 6, when he was caught in the fly-wheel of the engine. When found between the belt and the wheel, Mr. Fenner was mangled almost beyond recognition. He is survived by a widow and seven children.

A new 250 horsepower turbine which had just been installed by the Sheffield Brick & Tile Company, Sheffield, Iowa, exploded recently, throwing castings in all directions. Fred Beeton, an employe, was struck in the head by one of the pieces of the iron and killed almost instantly. Another employe suffered an injury to his leg.

The McGuire Electric Porcelain Company has taken over the plant of the New Brunswick Tile Works, at New Brunswick, N. J., and will begin operations in a very short time. George E. McGuire, who will have the management of the company, is secretary of the Trenton Porcelain Works, at Trenton, N. J. Electric porcelain fixtures will be manufactured at the plant.

The plant of the Hydraulic Press Brick Co., at Menominee, Wis., was badly damaged by fire the night of April 5; the loss is estimated at $10,000. A high wind was blowing at the time of the fire and it was only by hard work that the plant was saved from entire destruction. The fire started in the dryer which was almost completely destroyed, together with the roof of the kiln sheds.

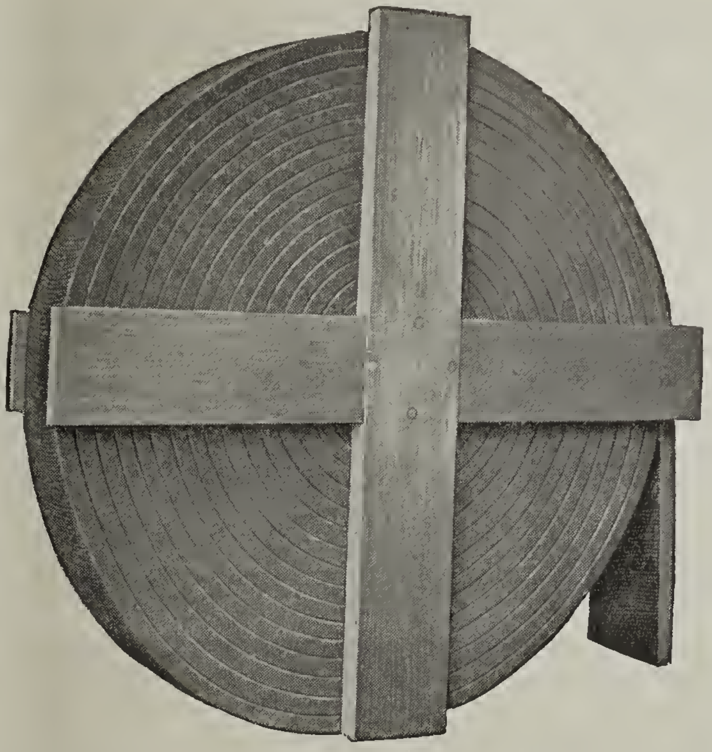
At the recent annual meeting of the National Fire Proofing Co., at Pittsburgh, Pa., President W. D. Henry reported the amount of business transacted so far this year as largely in excess of that period in 1915. Since January 1 over one thousand more cars of product were shipped than for the same period last year. The election of directors resulted as follows: For one year: S. F. Heckert, W. E. Cooke, George A. Jones and J. J. Booth. For two years: D M Campbell, J. S.

(Continued on page 494.)

Barrett's

Expansion Joint

(Fibre-Weld Process)



All the Technical Advantages of the Poured Joint — and it's Ready Made

THE use of a bituminous expansion joint for concrete pavements and for block pavements where a grout filler is used has been the practice for many years.

Up to within a short time, the prevailing type of joint has been the poured joint, either Coal Tar Pitch or Asphalt, applied hot. While such a joint fully meets the requirements of elasticity, permanence and adhesion to the adjoining paving or curb, the practical difficulties in the way of proper application have led to the call for a ready-made bituminous joint filler.

As manufacturers of Barrett's Paving Pitch, The Barrett Company have supplied paving engineers and contractors with filler materials for over forty years, and are, therefore, well equipped to understand their needs in the expansion joint field. Their paving engineers in conjunction with their laboratories, have been at work on this problem for an extended period, with the result that they now offer Barrett's Expansion Joint as the best ready-made joint filler on the market.

Barrett's Expansion Joint is made by the new Fibre-Weld process which produces a bituminous mastic of unusual texture, having high tensile strength and retaining its shape at all paving temperatures. It is absolutely waterproof and not injured by street acids or automobile oils. It is flexible and pliable under all weather conditons; it will not become brittle with age; it will not chip in cold weather nor soften or run in hot weather.

Unlike other ready-made expansion joints, this material furnishes all the elasticity of a poured bituminous joint. It has no hard unyielding layers of felt or other forms of rigid reinforcement found in many other ready-made joints, which seriously impair the ability of such joints to meet paving expansion requirements.

Barrett's Expansion Joint is a uniform homogeneous mastic as distinguished from alternating layers of felt and bitumen, and this eliminates the tendency to split and separate or slip under pressure of expansion. It will not rot nor deteriorate in service, which is most important in view of the fact that the expansion joints are usually placed at the curb and are subject to the greatest amount of moisture and street liquids.

Barrett's Expansion Joint offers great protection to the edges of paving blocks and to the edges of the concrete at the expansion joints.

In use, a width is simply selected that will stand in place about one-half inch above the surface of the pavement; the joint can then be flattened out or mushroomed so as to cover and protect the edges on both sides. The mastic is so tough and resilient that it will withstand the wear of traffic and give excellent protection to the exposed edges thus materially reducing the weakness of the transverse expansion joint.

The material comes ready-to-lay, in handy ribbon form, in all practical widths and thicknesses. Simply unroll, cut to the desired length and lay it. No tools, equipment, skilled labor, or apparatus required.

The amount of material required for any given job can be accurately estimated, thus eliminating waste. In addition to pavements, this Joint can advantageously be used for expansion joint purposes in laying Portland cement sidewalks and in all forms of concrete construction where expansion joints are required.

Barrett's Expansion Joint is made in the following standard sizes:

Widths 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½ and 8 inches.

Thickness	Lengths	Thickness	Lengths
⅛ inch x	200 feet	½ inch x	50 feet
¼ inch x	100 feet	¾ inch x	33 feet 4 in.
⅜ inch x	50 feet	1 inch x	25 feet

Samples

The unique character of the bituminous mastic in Barrett's Expansion Joint can only be appreciated by examination of a sample. It is absolutely and entirely different from any other expansion joint on the market. Samples gladly furnished. Write for same, specifying thickness and width desired.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

EDITORIAL NOTES AND CLIPPINGS—Continued.

Craig, W. L. Curry and H. M Koasbey For three years: J. B. Finley, W. D. Henry, John R. Gregg and E. H. Straub.

E. V. Kelly and J. H. Kitchen are organizing a company at Ashland, Ky, for the purpose of operating the plant of the O'Kelly Brick Co.

A brick plant will be established at Beulah, N. D., by the Black Diamond Coal Co. The company has had the clay analyzed with very gratifying results.

The capital stock of the Paducah Clay Company (Ky.) has been increased from $12,000 to $100,000. The company operates a large clay mine near Briensburg, Ky.

The widow of Minas Tamas, who was killed by a fall of shale in the plant of the Alliance Clay Product Company about six months ago, has been awarded $2,209 by the state liability board.

The Loogootee Face Brick and Tile Company, Loogootee, Ind., has been organized with $50,000 capital stock. The directors of the company are T. H. Browning, John O'Brien and G. M. Risacher.

The plant of the Barrington Steam Brick Co., at Providence, R. I., which was destroyed by fire early in March, will be rebuilt. The work of construction was started as soon as the insurance had been settled.

The Medal Brick Company, which has taken over the plant of the Wooster Shale Brick Co., at Wooster, Ohio, has announced that the plant will be rebuilt and remodeled with the view of doubling the capacity of same.

Pocatello, Idaho, is to have a new brick plant under the management of Benjamin Cooper. The plant will be equipped throughout with modern machinery and appliances. They expect to be ready for operation about the first of May.

The Wolf-Lanning Company, headed by Dr. E. A. Wolf and Theodore Lanning, has been organized at Dennison, Ohio, where they will erect a large plant for the manufacture of brick and sewer pipe. Work on the plant will begin at an early date.

Louis Brush, a retired brick manufacturer of Buffalo, N. Y., committed suicide recently at his home in that city. Mr. Brush was 73 years old and had been in ill health for some time, which is supposed to have unbalanced his mind. He leaves a wife and two daughters.

The Maryland Clay Products Company has been incorporated to manufacture fire brick and fireproofing at Lonaconing, Md. They have plans under way for a plant to cost $250,000. Louis Rancke, the well known clayworking engineer, will have charge of the erection of the plant.

The Corry Brick and Tile Company, of Corry, Pa., will build an additional kiln and enlarge their dryer which will enable them to increase their daily capacity about 25 per cent. The company is now working at full capacity and is shipping brick to Syracuse, Oil City, Erie, Baltimore, New York City and to Williamstown, Mass.

A company of which John A. Sing, of Marshalltown, Iowa, is president, and A. C. Brenneck, secretary, has been organized to establish a brick and tile plant at Winterset, Iowa. The company expects to have the machinery in place and everything running by July 1. They will construct a large continuous kiln of 40,000 daily capacity.

The Westfield Clay Products Company, at Westfield, Mass., is the name of a new concern which has been organized to take over the construction of the plant of the Westfield Brick Company which was started last year. D. L. Gillett is at the head of the concern and states that the work will be completed by the first of June. The plant will have a daily output of 125,000 brick a day.

The state of Ohio has again leased the plant of the Junction City Clay Product Company for the term of one year. the prior two years' lease having expired on March 31. The state has also been given first option on the purchase of the property which it has operated with considerable success the past two years and it is the general opinion that the property will be taken over by the state within the next year.

It is a dull day in Detroit when some of the brick manufacturers of that city fail to get mention in the daily press. A recent notice is to the effect that Charles H. Bryan, of the Mercier-Bryan-Larkins Brick Co., is being boomed for the nomination of mayor on the Democratic ticket. Mr. Bryan is well and favorably known both in business and political circles and if he wins the nomination will stand an excellent chance of being Detroit's next mayor. Here's hoping.

John Baumgartner has sold his brick and tile factory at Chatfield, Ohio, to his sons F. A. and W. H. Baumgartner, who will operate the plant in the future.

The Muskegon Brick & Tile Company has been organized and will establish a plant at Fruitport, Mich. The capital stock is given at $10,000.

W. R. White has purchased the interest of J. H. Fleming in the Bristol Brick Company, at Bristol, Tenn. The company has been reorganized and Mr. White has been elected president of same.

Leiby & Landis, brick manufacturers of New Cumberland, Pa., are running full handed, having recently booked orders for over 5,000,000 brick, which will keep them busy for some time to come.

John O. Spurgeon, for a number of years manager of the Herbst (Ind.) Drain Tile Company, died at his home in Gas City, Ind., April 8. Mr. Spurgeon was 70 years old and leaves a son and one daughter.

The Waynesfield Drain Tile Company, of Waynesfield, Ohio, has been incorporated by John W. Allen, B. L. Shultz, Elsie P. Shults, Gilbert W. Bailey and Flo Bailey. The company is capitalized at $40,000.

After having been closed down for several years the plant of the Ashaway Clay Works, at Providence, R. I., is being put in condition for operation. It is expected the company will be able to turn out brick by the first of May.

The Canadian China Company, Ltd., Montreal, Quebec, Can., has been incorporated with a capital stock of $1,500,000 by Francis G. Bush, George R. Drennan, Michael J. O'Brien and others to manufacture china clay products, etc.

W. A. Buhlinger, secretary and Treasurer of the Hill & Karnes Brick Company at Paducah, Ky., writes that while he has purchased the interest of Mr. Karnes in that concern the name of the firm will not be changed.

Thomas Conners, of Columbus, Ky., has purchased the plant of the Wickliffe (Ky.) Clay Product Company and will consolidate same with his plant at Columbus which he will rebuild and bring up to date by the installation of new machinery and appliances.

The Hamilton Stock Brick Supply Company, of Hamilton, Ontario, Canada, has been incorporated to manufacture building material and builders' supplies; $40,000 capital stock; provisional directors, Edward New, Wm. H. Cooper, John E. Prid and others of Hamilton.

A barge containing 142,000 paving brick sank in the Ohio river at the Peebles Paving Brick Plant at New Boston, near Portsmouth, Ohio, recently. The barge was to have contained a shipment of 190,000 brick for Parkersburg, W. Va. Both barge and contents are insured.

The Fulton Brick and Mining Co. is the name of a new company which has been organized by Frank Mohr, at McArthur, Ohio. Mr. Mohr will take over the old Mohr and Minton plant at that place and will remodel same and have it in operation by the middle of May.

The large and modern pottery of the Consolidated Manufacturing Company, at Grafton, W. Va., will be offered at public sale by the court April 22. The plant cost in the neighborhood of $175,000, and at the time it was completed was admitted to be the last word in pottery contruction.

The Builders and Traders Exchange of Detroit, Mich., have about completed plans for a permanent building exposition which will be opened formally about May 1. The Detroit Brick Manufacturers and Dealers Associatiotn will have an attractive display showing a house constructed with brick.

Application has been made for charter by the Buffalo-Shoals Clay Manufacturing Co., of Statesville, N. C. The capital stock of the company is given at $30,000, and those interested are E. R. Rankin, E. G. Gaither and F. F. Steele. A large plant will be erected on the Catawba river, ten miles west of Statesville. While the chief product will be facing brick, tile and other clay products will also be manufactured.

Clippert, Spaulding & Co., of Lansing, Mich., report that they have started in with prospects for an unusual busy season. They are now working to full capacity and installing additional machinery which will enable them to materially increase the output. George C. Clippert, superintendent of the work, says they will continue to add equipment from time to time as demand increases to keep pace with the building progress of this city.

Metallic Radiation Heat Dryers

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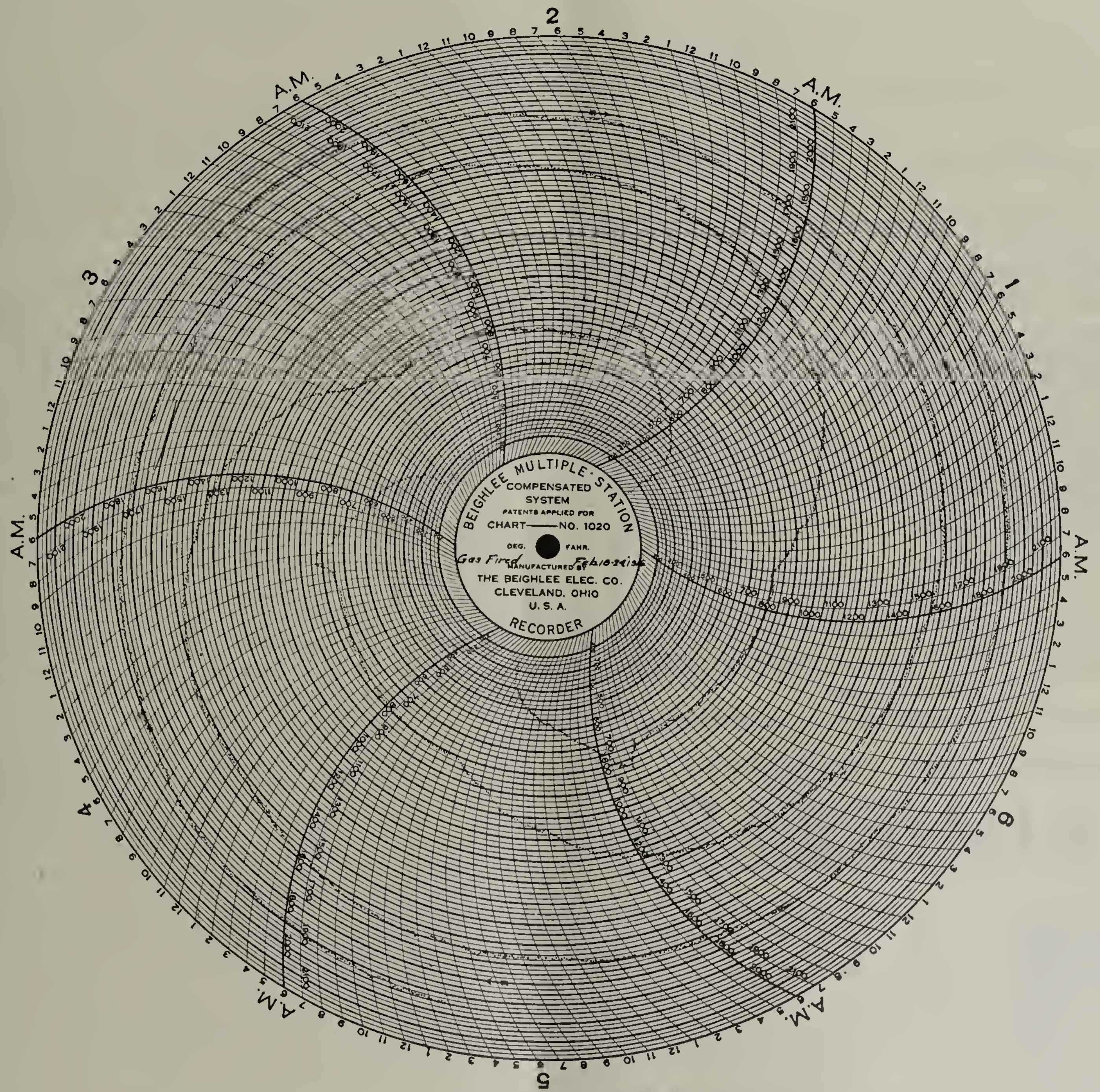

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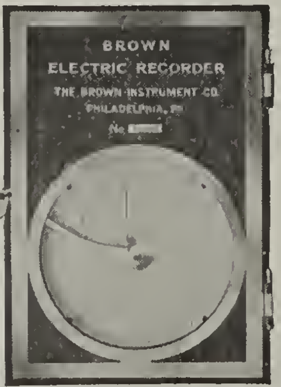

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THE CERAMIST'S CORNER.

(Continued from page 433.)

seems to have been hampered somewhat by the fact that very little barium carbonate is produced in this country, though a considerable quantity of barium sulphate is mined. From 1912 to 1913 the importations of natural carbonate decreased from $15,000 to $13,000,[2] while those of the artificial carbonate increased from $10,000 to $39,000. Inasmuch as this artificial carbonate is made from the sulphate, it is thought that perhaps a resume of the facts of the case might stimulate such an industry in this country.

Barium belongs to the group of alkaline earth metals which includes calcium, magnesium and strontium. There is reason to believe that barium is as widely distributed as calcium or magnesium, but in such small quantities that it is not generally reported in the ordinary chemical analysis. The analyses of a large number of rocks leads to the conclusion that barium ranks about thirteenth in the order of abundance of the elements, and the entire lithosphere contains about one-tenth of 1 per cent. of barium oxide.[3] Under the action of weathering these rocks disintegrate, and their components are frequently dissolved and transported by water. If conditions are favorable, the calcium or magnesium may become concentrated and precipitated in the form of carbonates, as limestone, chalk, dolomite, magnesite; or in the form of sulphate, as gypsum. Similarly, barium may be deposited as the carbonate (witherite) or as the sulphate (barytes). There is evidence to show that, in some localities at least, the barium has been brought up from below by subterranean waters, instead of being concentrated by surficial disintegration.[4]

There are then two minerals which serve as commercial sources of barium—the carbonate, witherite, and the sulphate, barytes. Witherite is much more valuable on account of the facility with which it can be transformed into other salts, but unfortunately no workable deposits of witherite are known to occur in the United States. Our entire domestic supply is derived from barytes.

Barytes generally occurs in small veins, lenses, or even mere fragments, imbedded in a matrix of sandstone, limestone or clay, and in such a condition that it is usually necessary to hand-pick it in order to obtain it reasonably free from the surrounding impurities. This mode of occurrence is probably the main drawback to the industry, for it would hardly pay to use any but the crudest methods of mining when the deposits are so small individually, and so uncertain. Thus we find that in Missouri (the chief producing area of the United States) "practically all the barytes is mined from shallow shafts and open cuts by farmers or other people during periods of inactivity in other industries."[5] Besides the Missouri district, the only producing area in the United States is in the southern Appalachian region, embracing small deposits in Virginia, Tennessee, North Carolina, South Carolina and Georgia. Abandoned barytes mines may be found in Connecticut, Kentucky, Nevada, New York and Pennsylvania, and deposits have been observed in almost every State in the Union.[6] The total production of domestic crude barytes in 1913 was valued at $156,275, at an average price of $3.45 per ton, hand-picked, cobbed and sorted at the mine. In addition to this, there was imported $61,409 of crude barytes, under a duty of 15 per cent. ad valorem.

Crude barytes is a white, opaque or translucent mineral, generally made up of aggregates of straight or slightly curved plates, although it sometimes occurs in granular or fibrous masses. It is frequently quite pure, the chief impurities being grains of foreign matter, such as galena or pyrites, disseminated throughout the mass, or stains of iron or clay which discolor the surface. Besides being a source of other barium salts, it is used as such in a number of industries, because it possesses three distinctive properties: It is white in color, is extremely heavy, and is not attacked to any extent by any ordinary reagent. In order to prepare the crude material for the market, it is necessary merely to free it from its impurities, and grind it to the desired size. The usual mode of refining is to break the crude material to a size ranging from one-eighth inch to one-half inch, depending on the amount of iron present. The gross impurities can be mostly removed by jigging. The discoloring stains on the surface of the lumps are bleached out with sulphuric acid. The barytes is treated with acid having a density of about 20 to 30 degrees Beaume, and the mix is stirred with live steam until bleaching is complete. This takes from six to eighty hours, depending upon the quality of the raw material. The barytes is then dried and ground to an impalpable powder, when it is ready for the market as refined barytes.[7] A more efficient method is to grind the ore before bleaching, instead of afterwards. If the discoloring stains are very persistent, it is sometimes necessary to roast the ground ore with a mixture of sodium chloride, sodium nitrate and sulphuric acid. This converts the iron and manganese to the chlorides, which can be readily removed by subsequent bleaching. Another commercial grade of barium sulphate is a manufactured, rather than a refined, article, and is known to the trade as "blanc fixe." The process of manufacture is essentially the same for "blanc fixe" as for all other barium salts. Crude barytes is finely ground and mixed with one-fourth of its weight of powdered coal. The mix is burned in a rotary kiln, and the clinker produced contains 65 to 68 per cent. barium sulphide, the balance being mainly barium carbonate.[8] This barium sulphide can be dissolved in water, purified and treated with various reagents to produce different barium salts. To make "blanc fixe" the reagent is, of course, sulphuric acid, which precipitates the insoluble barium sulphate in a form which is purer, more finely divided and more nearly white than can ordinarily be produced by a mere refining process.

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[2] Jas. M. Hill—Production of Barytes in 1913—U. S. Geol. Sur.

[3] F. W. Clark—*Data of Geochemistry, U. S. Geol. Sur., Bull.* 330 (1908).

[4] A. A. Steel—*Geology, Mining, and Preparation of Baryte in Washington Co., Mo., Bull. 38, A. I. Min. E.* (1910).

[5] Hill—*loc. cit.*

[6] Samuel Sanford and R. W. Stone—*Useful Minerals of the U. S.; U. S. Geol. Sur., Bull. No.* 585 (1914).

Refined barytes or "blanc fixe" is used as a filler or adulterant in the manufacture of paper, rubber, leather and textiles. Since these materials are generally sold by the pound, the high specific gravity of barium sulphate renders its use quite attractive to the manufacturers. Its white color enables its presence to be readily concealed, and its extreme insolubility makes it permanent.

The use of barytes to replace white lead or zinc white in the manufacture of paint was formerly considered an adulteration. While it is probably true that the quality of paint produced from it is inferior for use on either wood[9] or steel,[10] barytes has achieved recognition as a true white pigment rather than an adulterant.[11]

In the paint and rubber industries, a mixture of barium sulphate and zinc sulphide is being marketed under the name of "lithophone." Barium sulphide, prepared by reduction of the sulphate with coal as described above, is dissolved and treated with a solution of zinc sulphate. The resultant precipitate of barium sulphate and zinc sulphide is calcined at a high temperature, thrown into water, and pulverized.[12] When used as a paint, lithophone is claimed to have a greater covering capacity than barytes. If lithophone is added to rubber, the resultant product can be made harder and tougher, with increased resistance to cutting and abrasion.[13] In either industry lithophone cannot be considered as a filler or adulterant.

The production of refined barytes in the United States during 1913 was valued at $525,300. $35,840 worth of refined barytes and $62,785 worth of "blanc fixe" were imported, under a duty of 20 per cent ad valorem. It will be noted that the refined barytes sold at an average price of $14.18 per ton, as compared with $3.45 for the crude material.

Next to the sulphate, the most important salt of barium

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[7] Edwin Higgins, Jr.—Barytes and its Preparation for the Market.—*Eng. News*, Vol. 53, p. 196 (1905).

[8] Edward K. Judd—Barytes Industry of the South.—*Eng. and Min. Jour.*, 1907, p. 751.

[9] Inspection of White Paint Test Fence at Washington, D. C. *Com. D-1, A. S. T. M.*, 1914.

[10] Inspection of Steel Plates at Atlantic City.—*Com. D-1, A. S. T. M.*, 1914.

[11] Analyses of White Pigments.—*Com. D-1, A. S. T. M.*, 1914.

[12] *U. S. Geol. Surv.—Min. Res. for* 1911, part 2, p. 968.

[13] Philip Schidrowitz—*Rubber*, p. 189.

(Continued on page 498.)

40 HOURS

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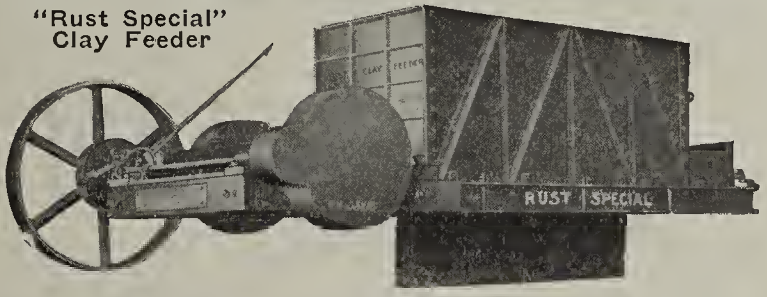

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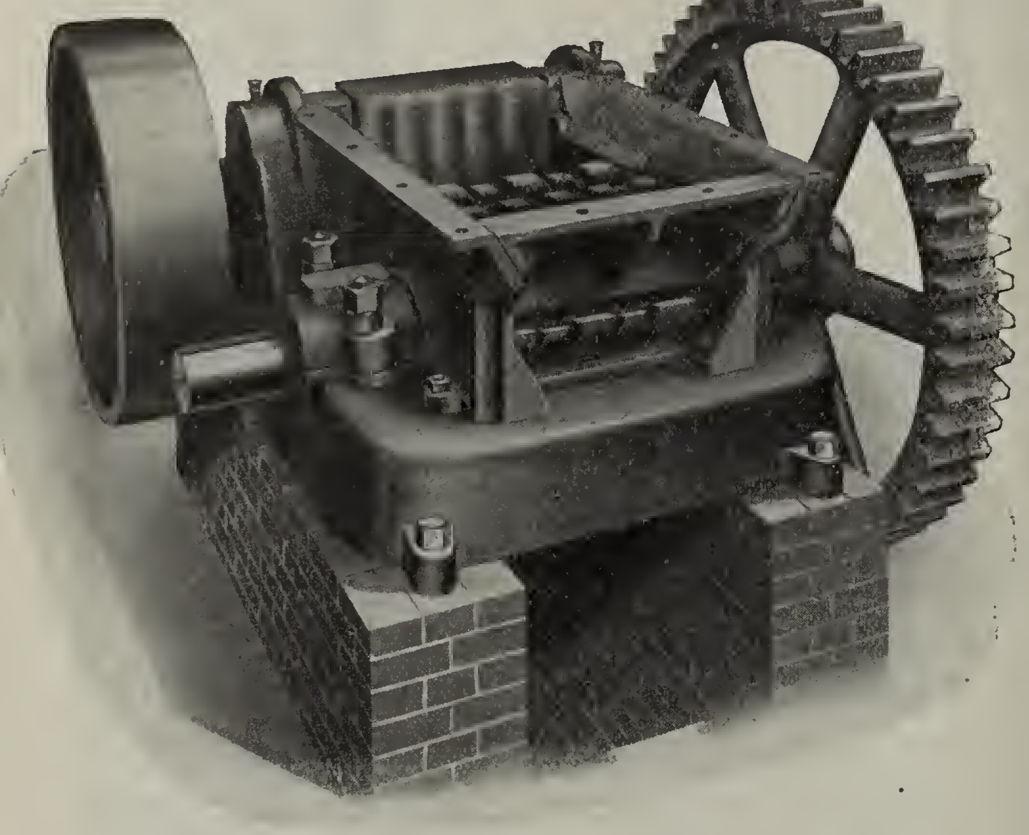

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THE CERAMIST'S CORNER.

(Continued from page 497.)

is the peroxide or binoxide, as it is known to the trade. This material can be produced from the sulphate by the following general method: The mixture of sulphide and carbonate obtained by the reduction process described above is treated with carbon dioxide until all of the barium is precipitated as the insoluble carbonate. This is mixed with coal and a little lime or magnesia, and is heated in retorts to 1200 degrees C., when the carbonate is reduced by the coal. The mass is cooled in a stream of pure dry air.[14] The resultant barium peroxide is a dark gray powder, which possesses the valuable property of being able to give up half its oxygen when heated to about 800 degrees C., and reabsorbing it if permitted to cool in air. It is therefore used to extract oxygen from the air. Theoretically, the amount of oxygen which can be extracted by a given weight of peroxide by repeated heating and cooling is unlimited, but practically, the pure peroxide soon loses its efficiency. This is due to incipient fusion of the material, so that less surface is presented for the absorption of oxygen. It is on this account that the small amount of time is added; to prevent fusion and keep the mass porous. The same end may be accomplished by heating the pure peroxide in a partial vacuum, when the oxygen is liberated at a lower temperature and with less danger of fusion.

In 1913, the imports of barium peroxide were valued at $239,000, under a duty of one and one-half cents per pound. The amount of this material used has been gradually decreasing, probably because of the competition of liquid air as a source of oxygen.

Among the other salts of barium, the only ones of particular commercial importance are the carbonate and the chloride. This can be made from the sulphate by reduction to the sulphide with coal, dissolving this in water, and treating the solution with either carbon dioxide or hydrochloric acid.[15] These salts are rapidly coming into prominence as reagents for the prevention of efflorescence on brick. Efflorescence is due to the soluble salts in the clay,[16] consisting principally of the sulphates of lime, magnesia and alkalies. These are dissolved by the water absorbed by the brick, and are finally deposited on the surface as a white scum, when the water evaporates. Of the salts commonly found in clay, only the sulphates require consideration as the cause of efflorescence on fired ware.[17] If the clay is treated with the chloride or carbonate of barium, the soluble sulphates will be converted to barium sulphate, which, on account of its extreme insolubility, cannot be brought to the surface of the brick by water. It is rather difficult to determine just how much barium should be added to a given clay, because some of it may be absorbed by the colloidal matter. One method is to determine the amount of soluble sulphate in the clay, and add twice as much barium as is required to combine with it.[18] Or, a sample of the clay may be treated with aluminum chloride until the colloidal matter is satisfied, after which the amount of barium absorbed is taken as a direct measure of the soluble sulphates present.[19]

A method recommended for plant control requires a number of bottles of about 500 cc. capacity. In each of these is placed 100 grams of clay, either air dry or damp, and enough water added to fill the bottles about three-quarters full. They are then set in a warm place for a short time, and shaken thoroughly, until the clay has become finely divided. A one per cent solution of barium chloride is then added to each bottle: One cc. in the first bottle, two cc. in the second, etc. Store in a warm place for twelve hours, with occasional shaking. Add a pinch of lime to each bottle, and, after the clay has settled, draw off 100 cc. of the supernatant liquid through a filter, and add to it a few drops of sulphuric acid. If turbidity develops, the bottle contained an excess of barium chloride. If, for example, the liquid from bottles 1 to 4 remains clear on the addition of sulphuric acid, while that from 5 to 10 shows turbidity, then the ratio of barium chloride to clay in bottle 5 is the proper ratio to be used in working the clay.[20] If the soluble sulphates have been extracted from the clay, their determination in the resultant dilute solution can be effected rapidly and accurately in the benzidine method, as given in detail by F. W. Buckmiller in the "Chemist Analyst," October, 1914, p. 20.

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[14] Mond—*Berichte*—1883, p. 980.

[15] A. H. Fay—Barytes in Tenn.—*Eng. and Min. Jour., Jan.*, 1907, p. 137.

[16] Henrich Ries—Clay Industry of New York.—*N. Y. State Museum—Bull.* 37.

[17] H. E. Ashley—Technical Control of the Colloidal Matter of Clays.—*Bur. of Standards—Tech. Paper No.* 23.

[18] Seger, quoted by Kerl, Cramer and Hecht—*Handbuch der gesammte tonwaren Industrie*, 1907, p. 523.

[19] Hirsch—*Tonind. Zeit.*, Vol. 28, p. 491 (1904).

Barium chloride is readily soluble in water; barium carbonate is not. The chloride is therefore better adapted as a reagent because a solution of it can be mixed with the clay very thoroughly and easily. On the other hand, if too much of the chloride is added, it amounts simply to the introduction of another soluble salt, and to that extent defeats its purpose. The best practice is to add nearly enough barium chloride to combine with the soluble sulphates, the rest of the barium required being added in the form of carbonate.

The value of the imports of these materials in 1913 were as follows: Natural carbonate (witherite), $13,116, duty free; manufactured carbonate, $38,949, 15 per cent ad valorem; chloride, $37,620, duty one-quarter cent per pound.

The salts of barium have been used to some extent in a number of the ceramic industries. In the manufacture of glass they have been used to a limited extent as a substitute for lead oxide. They have the advantage over lead in that barium oxide is entirely resistant to the action of the flame gases, either oxidizing or reducing. It has a much higher fusion point than either lime or stronia, so that careful temperature regulation is not so essential. On the other hand, barytes is easily soluble in water, and glass made from it is not so resistant to the action of chemicals as lime glass. Barium is generally added to the glass in the form of carbonate, but barytes may be used if sufficient coal is added to reduce the sulphate and render it chemically active. This coal precludes the use of barytes in lead glasses, for the coal will also reduce the lead oxide, and the metallic lead formed will spot the glass.[21]

Barium has sometimes been used in the manufacture of china bodies, because of the generally accepted principle that a variety of bases tends towards a lower fusion point. Its use has little to recommend it. It seems to impart better translucency, but the bodies have only a slight range of vitrification and are apt to be weak, of poor color, shrunk, or blistered.[22]

Barium salts are also used extensively in the preparation of mat glazes.[23]

An important use of barium is in the manufacture of enamels for iron. Where tin oxide is used as an opacifier, the presence of barium is very desirable, because it tends to prevent shivering.[24] Care should be taken, however, not to heat an enamel containing any great amount of barium in direct contact with sulphurous gases. At the temperatures involved (not over 700 degrees C.) the sulphur may combine with the barium to form soluble barium sulphide.

Barium salts when taken internally have a direct action on the muscular walls of the arteries, and will eventually cause arteriosclerosis.[25] They also act on the heart, and are apt to cause systole.[26] The chloride, sulphide and peroxide, being soluble in water, are the most dangerous. The carbonate is soluble in the juices of the stomach, and produces the same effects. The sulphate, being quite insoluble, is practically harmless. The laborer using barium salts should be cautioned to wash his hands thoroughly before eating.

It is believed that the use of barium salts as reagents to prevent the efflorescence on brick could be extended more rapidly if the production of these salts warranted it. A study of the processes outlined above shows that it should cost but little more to manufacture barium carbonate or chloride than to refine a poor grade of barytes. In 1913, the average value of crude barytes in the United States was $3.45 per ton; of refined barytes, $14.18. In 1912, the price paid for imported manufactured carbonate (duty included) was $21.85 per ton.[27] In November, 1914, barium chloride was quoted at from $75 to $90 a ton.[28] We have been able to discover only two plants in the United States which are equipped to manufacture the carbonate and chloride from barytes.

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[20] *Tonindustrie Kalendar*, 1908, part 2, page 99.

[21] Robert Dralle—*Die Glasfabrikation.*

[22] Herford Hope—Comparative effects of CaO, MgO, SrO, BaO, and ZnO on China Bodies.—*Trans. Amer. Cer. Soc.*, Vol. XI, 1909.

[23] Fred H. Rhead—Mat Glazes, *Trans. Amer. Cer. Soc.*, Vol. XI, 1909.

[24] R. E. Brown—Replacement of Tin Oxide in Enamels for Cast Iron, *Trans. Amer. Cer. Soc.*, Vol. XIV, 1912.

[25] J. G. Adams—*Principles of Pathology*—Vol. 1, page 306.

[26] Cattell—*Lippincott's Med. Dict.*, page 969.

[27] —J. M. Hill—*loc. cit.*

[28] Market report—*Jour. Ind. and Eng. Chem.*, Vol. VI, page 1051.

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NEW YORK AND VICINITY.

BUILDING DEVELOPMENT in and about New York this season promises to be larger than for a number of years. Money is easier and the controlling factors in the situation are disposed to loan it upon such operations as are projected. The only two influences which work against the liberal development of all such operations are high cost of building material and the possibility that employes in the building trades are going to insist upon higher pay beginning May 1. Their agreement expires this year and some of the trades are contemplating asking for higher wages.

Whether or not a battle between employers and employes will result if they do it is quite impossible to say at present. If a fight follows, then the development of building which is indicated will be seriously curtailed if it doesn't stop it entirely, with the exception of those contracts which must be done some way.

The cost of all varieties of building material has increased so much of late that anything further would result in prohibitive prices, and operations would suffer for that reason. As this is written, the employers are in a somewhat nervous state concerning these possibilities and no one can quite tell what the outcome will be.

The price of brick is very high for the season. While the prospects for good business are better than usual, the supply of brick at present is less. Nearly all yards are poorly supplied and early orders will be taken only at high prices. On the other hand, dealers are drawing from store and are letting them go at high prices only. It is true that there is now no real market for Hudson river stock. What it brings is largely a matter of negotiation between buyer and seller. From $8.00 to $10.00 is paid, depending upon conditions, but few want to pay these prices, as they call them, and object strenuously. But the brick cannot be obtained at less and buyers are obliged to pay them. Some in store are selling at still higher values. But the weather is open now and those which have been waiting delivery will come down the river rapidly, now that navigation is open and larger supplies will be available all over New York. A few are coming from Connecticut and some from New Jersey yards, but the price asked for these is quite as high, relatively, consequently buyers save but little, if anything, on their transactions.

The labor situation promises to be a matter which will worry makers this season. Workmen are hard to find and when they are found they ask such high prices that some do not feel that they can pay such high figures. But the various industries, which are booming because of the war abroad, and the reduction in immigration, have combined to curtail the number of laborers available. Brick men will have to pay the price that others pay or go without employes. Some yards may not open at all because of this condition. Others promise to run with a reduced number of employes. Both methods reduce output and may result in cramping building later. In some yards, where operations have begun, demands for higher wages have already been made. It doesn't look very promising for manufacturers under such conditions. But they hope for a good trade, and if they get it they will be able to pay the price which the luxury of having employes in their yards suggests.

The American Express Company will erect a fifteen-story building on its Broadway site, the whole structure to be used for its own business. Redwick, Aspinwall & Tucker, West Fortieth street, New York, have prepared the plans, and the Cauldwell-Wingate Company, 381 Fourth avenue, will execute the contracts. The building is to be ready February 1, 1917.

A new fourteen-story apartment hotel is to be erected in West Sixty-ninth street, on a plot 40x100 feet, to cost $260,000. Schwartz & Gross, 347 Fifth avenue, are the architects. The plans were the first filed which complied with the new code requirements respecting light and ventilation.

Among the numerous new projects is a hotel on Seventh avenue, opposite the Pennsylvania station, to cost $4,500,000. A second one at Seventh avenue and Fiftieth street will cost $7,500,000. No further information is obtainable now.

BURTON.

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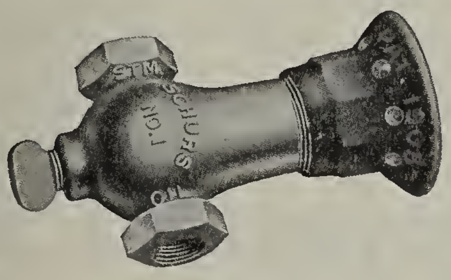

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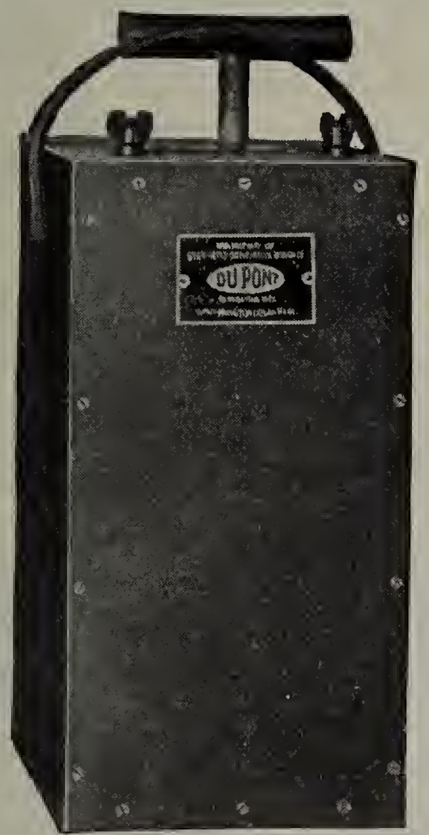

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BOX 2—RIGHT MAN,
2 3 c Care The Clay-Worker.

FOR SALE.

A GREAT BARGAIN.

An Oliver Typewriter, most recent style, just as good as new, having been used as a demonstrator only. Carries factory guarantee. Will be sold for half price for cash. Address

BOX 6—OLIVER,
Care Clay-Worker.

CLAYWORKERS, ATTENTION!

Glazes—Slips—Bodies developed in your own plant under your own conditions. Specific manufacturing problems or the development of new products.

Have had eight years' experience as Chief Chemist with one of the largest high-class Terra Cotta and Faience concerns in the country. American college graduate in ceramics. Not so theoretical as to miss the point of the application of science to modern commercial and business methods.

4 1 cm H. A., care The Clay-Worker.

MANGANESE

BEST QUALITY MANGANESE, CAREFULLY AND UNIFORMLY PREPARED FOR BRICKMAKING. WRITE US FOR SAMPLES AND PRICES.

NATIONAL PAINT AND MANGANESE CO.
LYNCHBURG, VA.

MINERS AND GRINDERS.

FOR SALE OR LEASE.

Plant of the New Anacostia Brick Company in Washington, D. C. Forty acres of clay land. Complete machinery for 60,000 daily output. Thew steam shovel. Steam dryer, kilns, etc., in good condition. Land is ripe for subdivision and worth the price of entire plant. Will sell plant and lease land. Constant, steady growth of this city, the annual appropriation of millions by congress for erection of public buildings and scarcity of brickyards in Washington, make this the cheapest offer in any part of the country today. For terms, etc., apply to

R. A. PYLES,
2 3 cm 2015 Nichols Ave. S. E., Washington, D. C.

FOR SALE.

COMPLETE BRICK PLANT, PRACTICALLY NEW.

Run only SIX WEEKS. Comprises complete steam power unit of 125 h.p. Freese Brick Machine, with automatic side-cut, Frost 9-foot Dry Pan, 60 double deck steel drier cars, belting, shafting, pumps, piping, etc. Everything complete, ready to run; inexhaustible shale deposit. Location, Hot Springs, N. C. We are not in the brick business and will sell plant as it stands, or dismantle and sell the machinery.

ANSON G. BETTS & CO.,
Asheville, N. C.

HOTELS STATLER

BUFFALO—CLEVELAND
DETROIT

Making Men Over

EVERY night we receive hundreds of tired men, worn out by a hard day in a strange city. And we make them over, and they go out next day ready for it.

Pleasant, well-ventilated, quiet rooms; good beds; courteous, gracious service; every convenience and comfort a tired man wants which a hotel can supply---these are among the good things you'll always be sure of at any Hotel Statler.

Your satisfaction guaranteed, whether you spend $1.50 or $20 a day.

Rates from $1.50 Per Day

BUFFALO
450 Rooms
450 Baths

DETROIT
800 Rooms
800 Baths

CLEVELAND
1000 Rooms
1000 Baths

The
ROESSLER-HASSLACHER
CHEMICAL COMPANY
100 William Street
NEW YORK

As a Preventative of Scums Use
CARBONATE OF BARYTES
R. & H. PRECIPITATED.

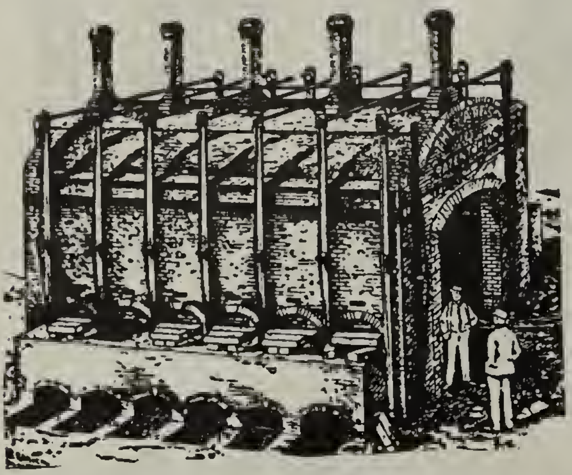
Oxide Tin,
Oxide Cobalt,
Red Oxide Iron,
Green Oxide Chrome,
White Oxide Antimony,
Black Oxide Manganese, and
all Chemicals used by the Clay Trades.

THE OREGON KILN

A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

E. SCHMATOLLA
Consulting, Designing & Constructing
Engineer and Patent Attorney
To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares.
150 Nassau St., New York, U. S. A.



The Yates Patent Down-Draft Kiln
Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

ALFRED YATES,
SHAWMUT, PA.

DENNIS SYSTEM OF KILNS AND DRYERS.
(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

Plans for tunnel dryers for either the car system or the Steel Pallet and Lift Car System.

For testimonials and further particulars address,

F. W. DENNIS,
1052 Bermuda St. Norfolk, Va.

Brick manufacturers who have anything in the way of second-hand machinery or appliances, will find a ready market for same through a card in our Classified Advertisements. Superintendents, yard foremen, burners, etc., desiring to make a change, will do well to run a Wanted ad in our classified department. Clay-Worker ads bring results.

Machine-Molded Gears

One to 6-inch pitch and larger. Our machine-molded gears last longer than others, give higher efficiency under actual scientific tests, and in many cases cost no more than inferior gears. Send for Catalog No. 38.

H. W. Caldwell & Son Co.
17th St. and Western Ave.
CHICAGO

NEW YORK CITY
Fulton Bldg., Hudson Terminal
No. 50 Church Street.
117 Main St., Dallas, Texas.

OAK HILL
GAS RETORT
AND
FIRE BRICK
WORKS

The Parker-Russell
Mining and Manufacturing Co.
ST. LOUIS, U. S. A.

Fire Clay and Silica Products of Quality for Service---
Especially for Kiln Construction.

Consulting
Prospecting
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Producer Gas-Fired Continuous Kilns and Dryers
Cost and Efficiency Systems. Old Plants Rehabilitated

JAMES P. WILLIAMS
CLAYWORKING ENGINEER
2803 N. Kings Highway
ST. LOUIS, U. S. A.

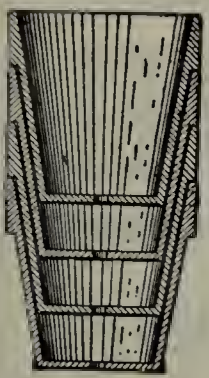
30% Average Cash Dividends

Did you ever investigate the **proven** high profits, assured safety and permanence of Silver Black Fox Farming?

Get the facts, then judge for yourself—not before. Unusual opportunity is offered to invest from $100 upwards on ground floor basis in conservatively capitalized, well managed company.

Send for prospectus which gives full facts, government reports, etc. Write promptly, as there is only a moderate amount of stock for sale.

Adirondack Ranch Co., Ind.
109 Arcade Bldg., Utica, N. Y.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
1801 English Ave. INDIANAPOLIS, IND.

New Books Which Are Being Offered To the Trade:

HOLLOW TILE HOUSE, by Fred'k Squires, Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

CEMENT, CONCRETE & BRICK, by A. B. Searle, Price, $3.00.

A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) **Indianapolis, Ind.**

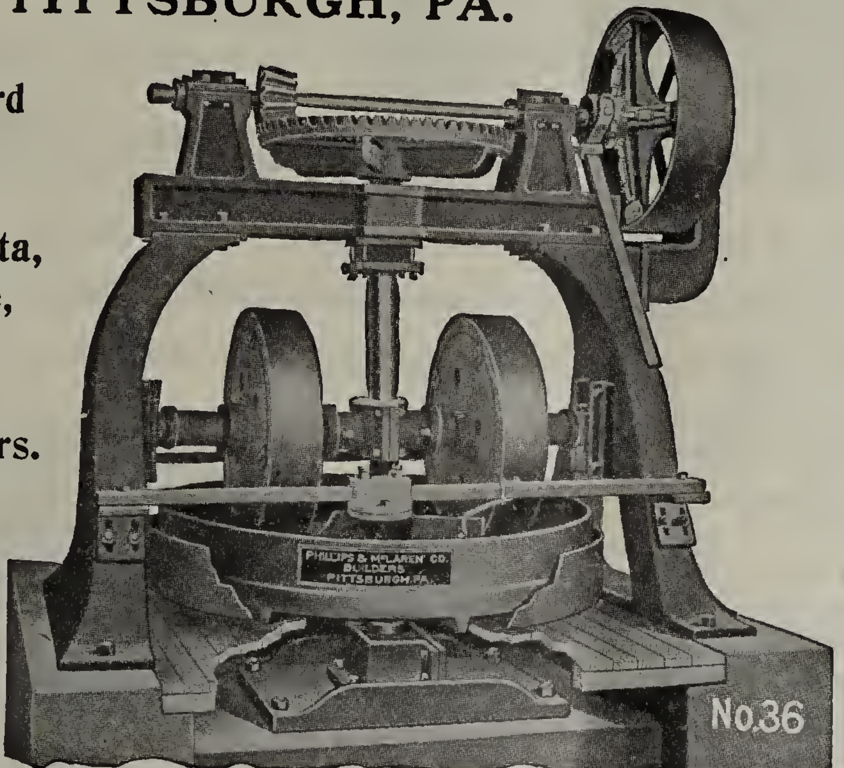
PHILLIPS & McLAREN CO.

PITTSBURGH, PA.

Builders of
Pittsburgh Standard
Dry and Wet
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office
Stephen Girard Bldg.
Philadelphia, Pa.


PHILLIPS & McLAREN CO.
BUILDERS
PITTSBURGH, PA.
No.36

$2.00 *THE CLAY-WORKER* **$2.00**
ONE YEAR (IN ADVANCE)

Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.
EASTON, PA., U. S. A.

Correspondence solicited.

Chattanooga Paint Co.,

Chattanooga, Tenn.
Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.

If...

You Want to Sell or Buy...

Second-hand Clayworking Machinery, Tile Mills, or anything pertaining thereto.

If... You Want a Man

for any position or a position in any connection with the Clayworking Trades use the

For Sale and Want Columns of...

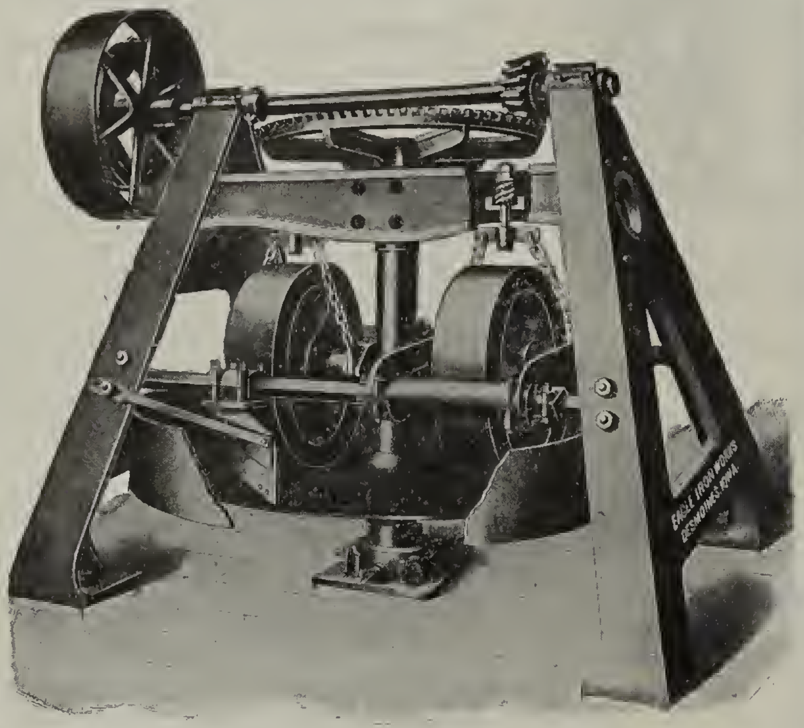
The... Clay=Worker.

RATES

For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of seven words to line. Head line counts as two lines.

Independent and Suspended Mullers

the distinguishing feature of our **DRY PANS**



Other valuable features which our catalogue fully describes.

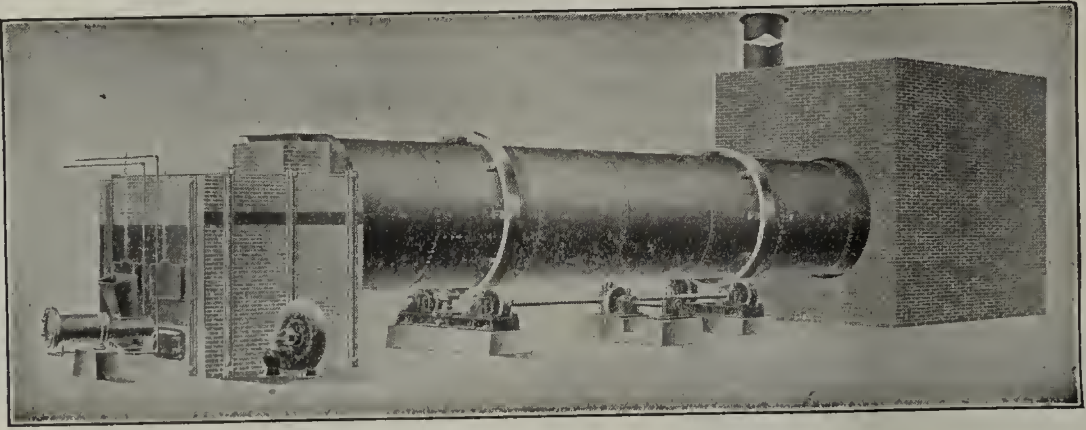
EAGLE IRON WORKS
Des Moines, Iowa

IRON & STEEL

KILN BANDS,

Rails,
Steel Plates, Bars,
Reinforcing Bars,
Shafting, Bolts,
Lugs, etc.
Forges, Blowers,
Blacksmith Supplies.

W. J. Holliday & Co.
Indianapolis, Ind.



ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

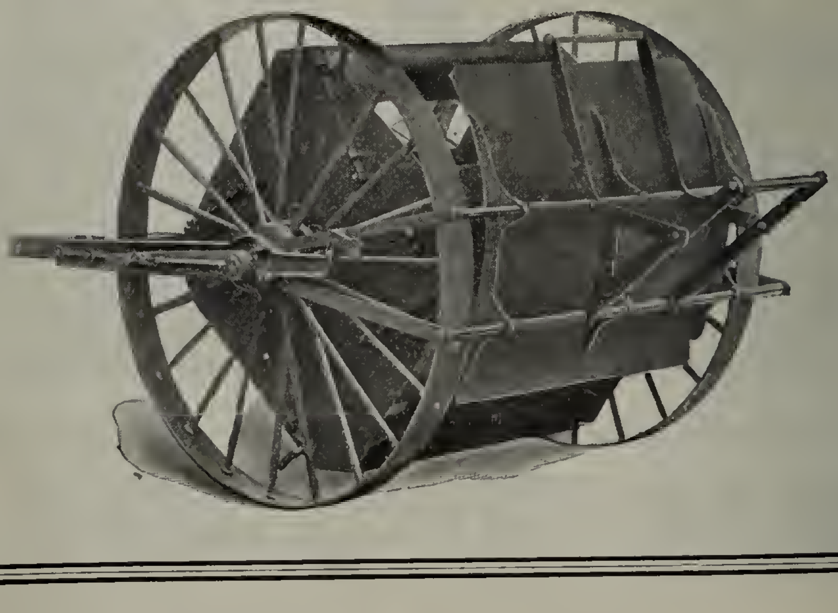
YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
NEW YORK

THE QUINCY IMPROVED GATHERER

used in connection with our SPECIAL CLAY PLOW is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
Quincy, Ill.



The Three Cardinal Virtues in All Brickmaking Equipment

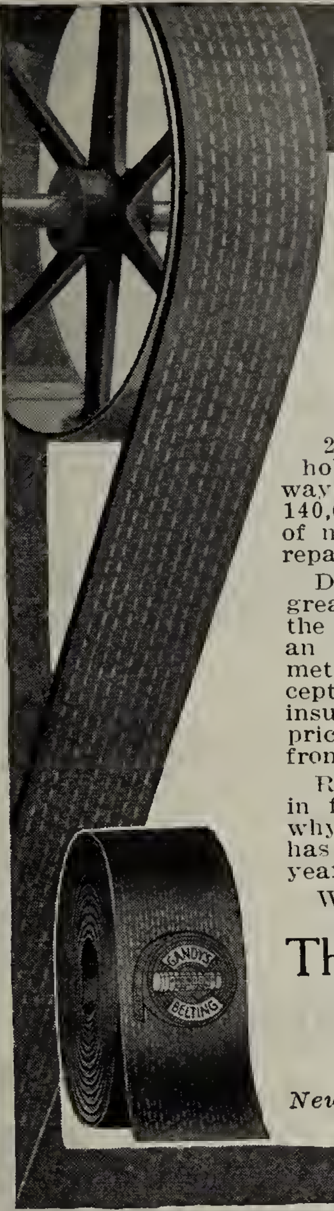
EFFICIENCY
ECONOMY
STABILITY

These you have in the highest degree in Brick Drying in

THE NATIONAL DRY KILN

INDIANAPOLIS, IND.

Write for Catalog, mentioning The Clay-Worker.



GANDY

On Main Drive For 27 Years

THE Bessemer Brick Co. has a Gandy Stitched Cotton Duck Belt which has been on steady duty for more than 27 years. Recently the lace holes pulled out—the first "giving way" during the manufacture of 140,000,000 fire bricks. But four feet of new Gandy Belting completed a repair—and the belt still runs on.

Dust-proof, water-proof and grease-proof service such as this is the reason Gandy Belting is such an economical purchase. Patent methods of manufacturing and exceptional care in selecting materials insure reliable service of this kind prices. from *every* Gandy Belt.

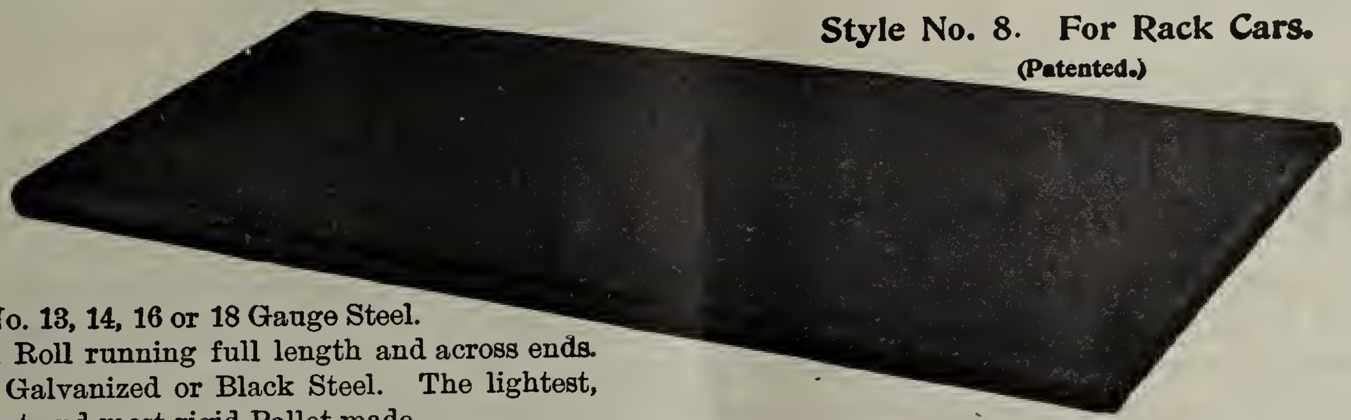
Resolve to send your next order in for a Gandy. See for yourself why the number of Gandy users has increased rapidly year after year.

Write at once for samples and

The Gandy Belting Co.
749 W. Pratt St.
Baltimore, Md.
New York Branch, 36 Warren Street.

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)



Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends. Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

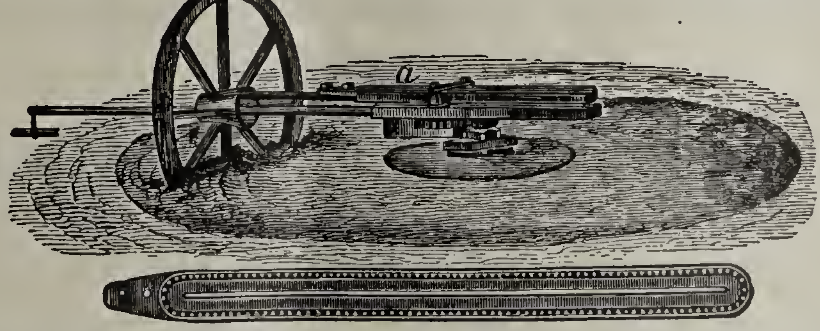
THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.

RED BRICK PRESS.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

MODERN CLAY-WORKING ENGINEERS

And Builders of Complete

BRICK MAKING PLANTS

For Either Soft or Stiff-Mud Processes.

Steam Power 50 Thousand
Animal Power 20 Thousand

We Build the Most Complete Line of Yard Supplies and

CRUSHERS

THE HENRY MARTIN BRICK MACHINE MFG. CO.
LANCASTER, PA., U. S. A.
Get Our Big Catalog.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

ECONOMY True economy is the sure road to wealth today, just as it has ever been. This is generally conceded, but it is not always certain what constitutes true economy. In the clay line it is ofttimes real economy to replace small capacity machinery with larger in order to meet the demands of a rapidly growing trade. Really it is false economy not to do so, for one must spend money to make money. He is wise who recognizes this truth and promptly replaces outgrown machinery with that equal to his needs. Then, after you have done the wise thing in enlarging and refitting your plant, don't let the outgrown machinery go to the scrap pile. It may prove a boon to some manufacturer starting a small capacity plant for which it will be ample. There are many such and they may be reached through an ad in the For Sale columns of The Clay-Worker. Be wise, not wasteful, and instead of letting your outgrown machinery rust out, advertise it in The Clay-Worker (see forms of ads under heading "For Sale, Wanted, Etc.," in this issue) and convert it into $ $ $ $ $ **CASH**

To insure insertion in current issue, copy should be furnished early in the month.

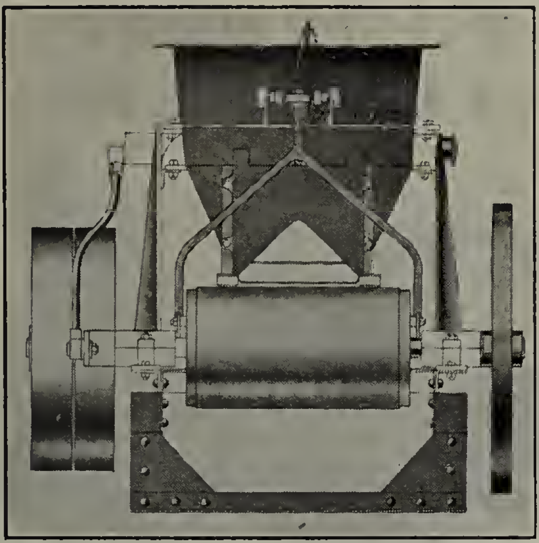
Address

THE CLAY-WORKER,

Indianapolis.

The Schaffer Poidometer

PATENTED



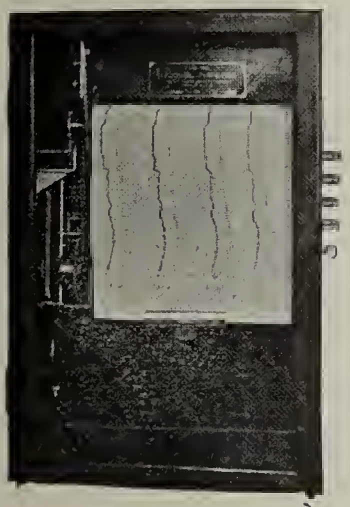
The Poidometers automatically temper the clay. They unite any number of materials in correct proportions. They weigh the materials, measure the water and deliver them in a predetermined quantity per minute in an even, constant flow.

They cause a uniform column of clay to flow from the brick machine at a regular speed.

INVESTIGATE AND
INVEST IN THESE MACHINES.
IT WILL PAY YOU.

The Schaffer Engineering & Equipment Co.
Tiffin, Ohio

The More Knowledge; The BETTER RESULTS



Catalog No. 3242
Eight Records on One Chart

It is obvious that the more you know about firing conditions in your

KILNS

the better you can control the burning of your product. It follows, therefore, that the pyrometer outfit which will enable you to secure the most information for the money is the most economical outfit to purchase.

TRADE MARK TWINKO THWING INSTRUMENT COMPANY

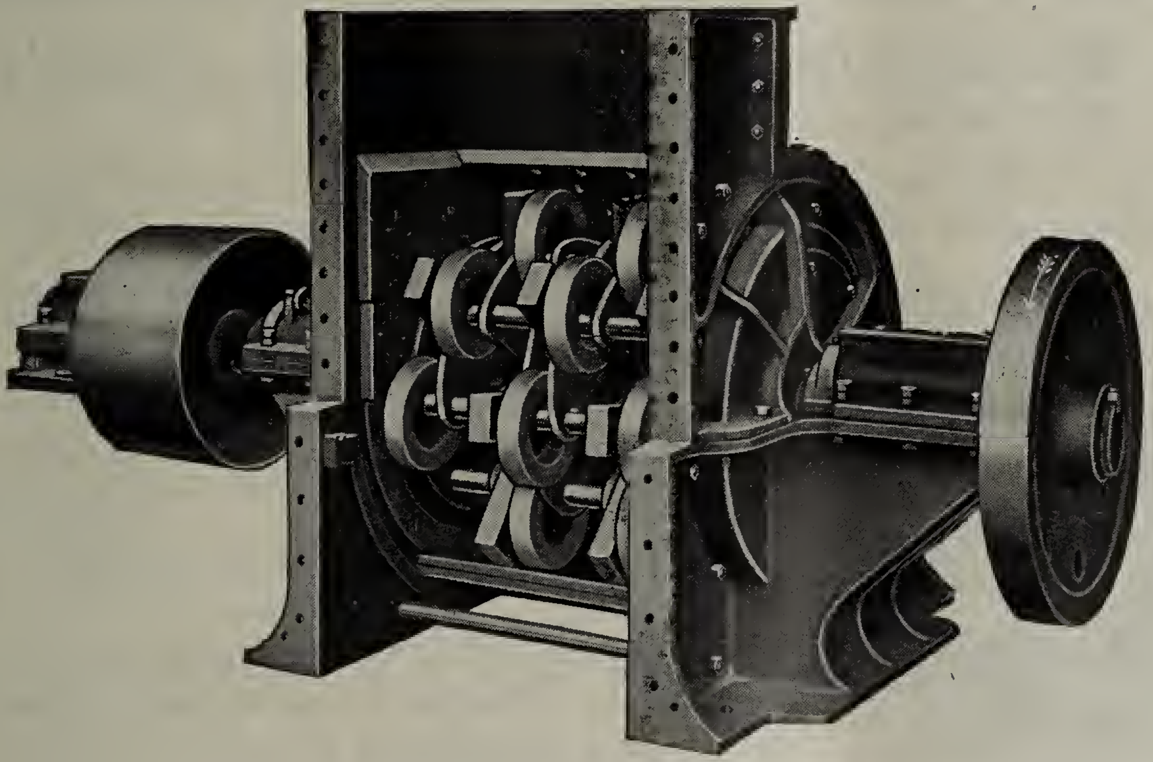
Multiple Record Recording Pyrometers

permit the recording of more data from more points in one kiln, or from a larger number of kilns, on a single record chart than any other make of pyrometers.

That is why they are being so universally adopted.

Tell us how many kilns you fire at one time, and we will submit a proposition that will delight you.

Thwing Instrument Company
439 N. 5th St. Philadelphia, Pa.



INCREASE

your output, grind finer, grind faster.

Reduce floor space, shafting, pulleys, belting, labor, power

and

pulverize each ton cheaper by installing an

AMERICAN RING PULVERIZER

Feed with a Feeder or Conveyor Belt and eliminate all labor at the Pulverizer. Use but one drive belt, one pulley, one elevator, one screen and save

INSTALLATION COST.

Describe your material, state tons per hour and screen mesh.
Write for catalog. Ask questions.

AMERICAN PULVERIZER CO., East St. Louis, Ill.

MR. CLAYBURNER

If you reduce radiation from crown and walls of kiln you save time and fuel. If you increase life of linings and prevent rust and corrosion on dryer cars, fans, pipes, etc., you save costly renewals. You can do these things with Carbide Coating at a nominal cost.

You may not believe that a coating or paint will protect linings. You, however, believe that salt glaze or a vitrified surface protects pipe and brick. Well, the pigment in Carbide Coating will endure heat that will burn up, vaporize fire brick and the vehicle or binder is the same article you get in salt glazing at the vitrifying temperature. The combination forms a composition which will protect linings, reduce radiation and protect metal from acid, sulphur and other corrosive fumes.

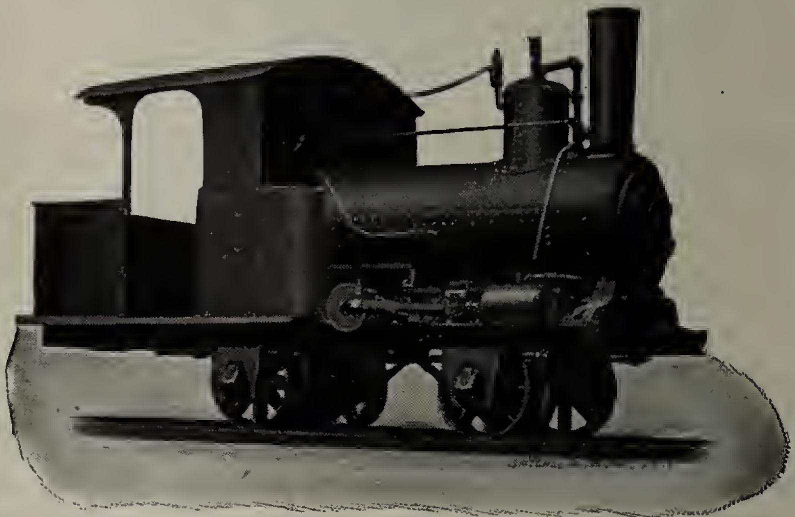
I will be very glad to show you how you can use this to advantage. Address,

E. R. STOWELL,
Oden, Mich.

INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

Over 300 Brick Manufacturers Using Thew Shovels

42 Thews in Cleveland.

Ask The American Building Brick Co.; The Barkwell Brick Co.; The Cuyahoga Brick and Shale Co.; The Deckman-Duty Brick Co.; The Farr Brick Co., and *The Ohio Clay Co.* what they think of their *Thews.*

The First Thew Shovel Still in Service.

Let us show you *Thews operating* that have been *in continuous service over 15 years.*

Last year the sign read 37 Thews in Detroit.

The Thew Company refers you to any Thew Shovel owner anywhere.

They do this because the *policy of the Company will not permit a Thew* to be *sold* to *any one unless* it *can give good results.*

The *Thew reputation for fair dealing* is *too valuable to sacrifice for a few orders. If the Thew cannot help you, they do not want you to have one.*

Here is what the owner of the *first Thew Shavel* says after it has been *in continuous service over 21 years: "No better shovel was ever put up. It is not very handsome to look at, but it is very economical in operation and does its work without any trouble. We can't say anything too good about the shovel."*

Use a Thew--It Pays.

Write for Circular 22-F.

THE THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Land Drainage, by J. L. Parsons. Price, $1.50.

A treatise on the design and construction of open and closed drains.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

Drying Brick, by W. D. Richardson. Price 25 Cents.

A little booklet giving and explaining the various styles of dryers, etc.

T. A. RANDALL & CO.

Indianapolis, Ind., U. S. A.

LET MENTZ

YOUR FUTURE

LET MENTZ MOULD YOUR FUTURE

LET MENTZ MOULD YOUR FUTURE

MENTZ MOULDS WILL MOULD YOUR FUTURE SO YOU WILL SAVE MONEY, MAKE A BETTER PRODUCT AND LARGER PROFITS.

MR. George B. Mentz has made a lifetime study of the manufacture and use of brick moulds on his plant near the Hudson River. His close contact with the manufacturers of soft mud brick and the brick business in the East affords him every opportunity of knowing what is required and what is absolutely right. His moulds meet every requirement, and today are far superior to any other moulds made in this country.

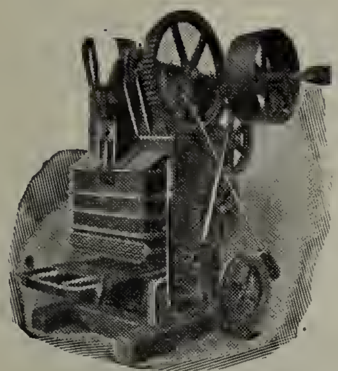
The general use of Mentz Moulds in the great Hudson River and New Jersey brickmaking districts and throughout the East and in Canada, shows their real value. These moulds are also found in the leading soft mud plants in the Middle West. It is a fact that can be proven that no brickmaker who has given the Mentz Moulds a fair trial would do without them.

Write for Information.

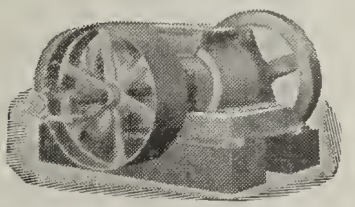
The G. B. MENTZ CO.

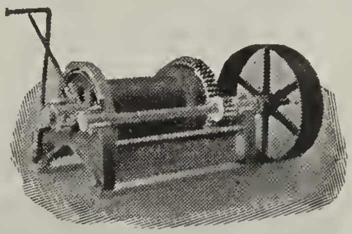
WALLKILL, N. Y.

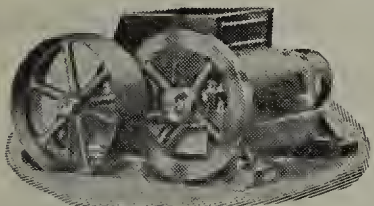
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.


Vertical Brick Machine

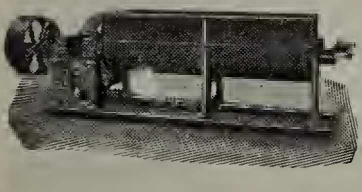
Style "A" Mould Sander

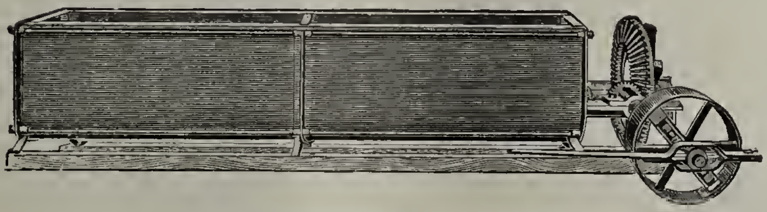

Style "P" Roller-Crusher

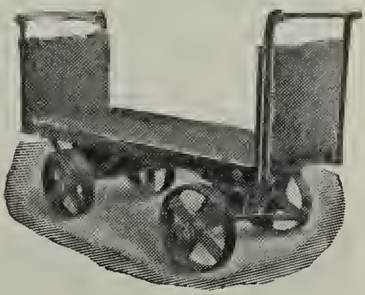

Style "B" Winding Drum

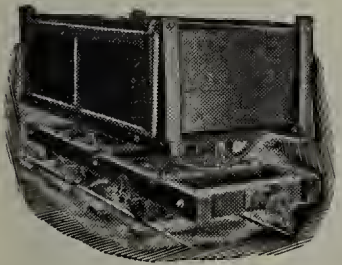

Style "A" and "P" Disintegrator

Style "P" Compound Disintegrator and Crusher

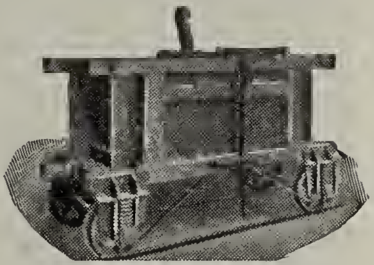

Double Geared Pug Mill

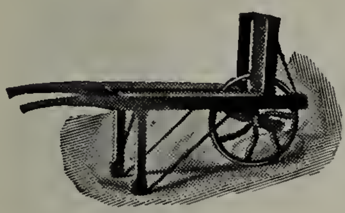

Single Geared Pug Mill


Mule Truck

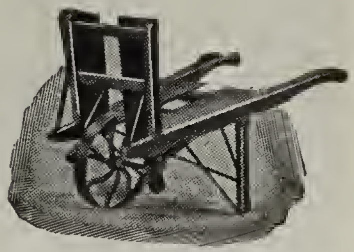

Side Dump Car

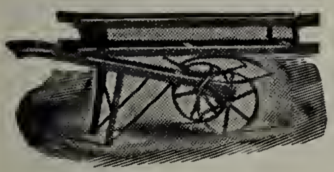
Feeder or Granulator

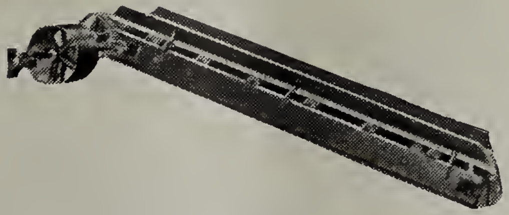

Bottom Dump Car

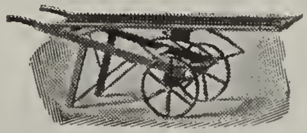

No. 6 Barrow

The Potts Rocker Grate
For any size fire box
on boiler or kilns


No. 2 Barrow


Double Deck Truck


Clay Elevator.


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for Prices.

If it's to be Had We Have it.

THIS DRYER WILL SAVE YOU MONEY

THE "Wellington" Improved Steam Pipe Rack Dryer combines every possible Economy with the highest degree of Efficiency.

IT is a low pressure vacuum system with the FIRST COST LOWER than any other dryer. It can be installed at LESS EXPENSE and operated at a big saving in power and labor.

WE will give you the facts and figures to PROVE IT or you can ask any of the many satisfied users of this economical dryer.

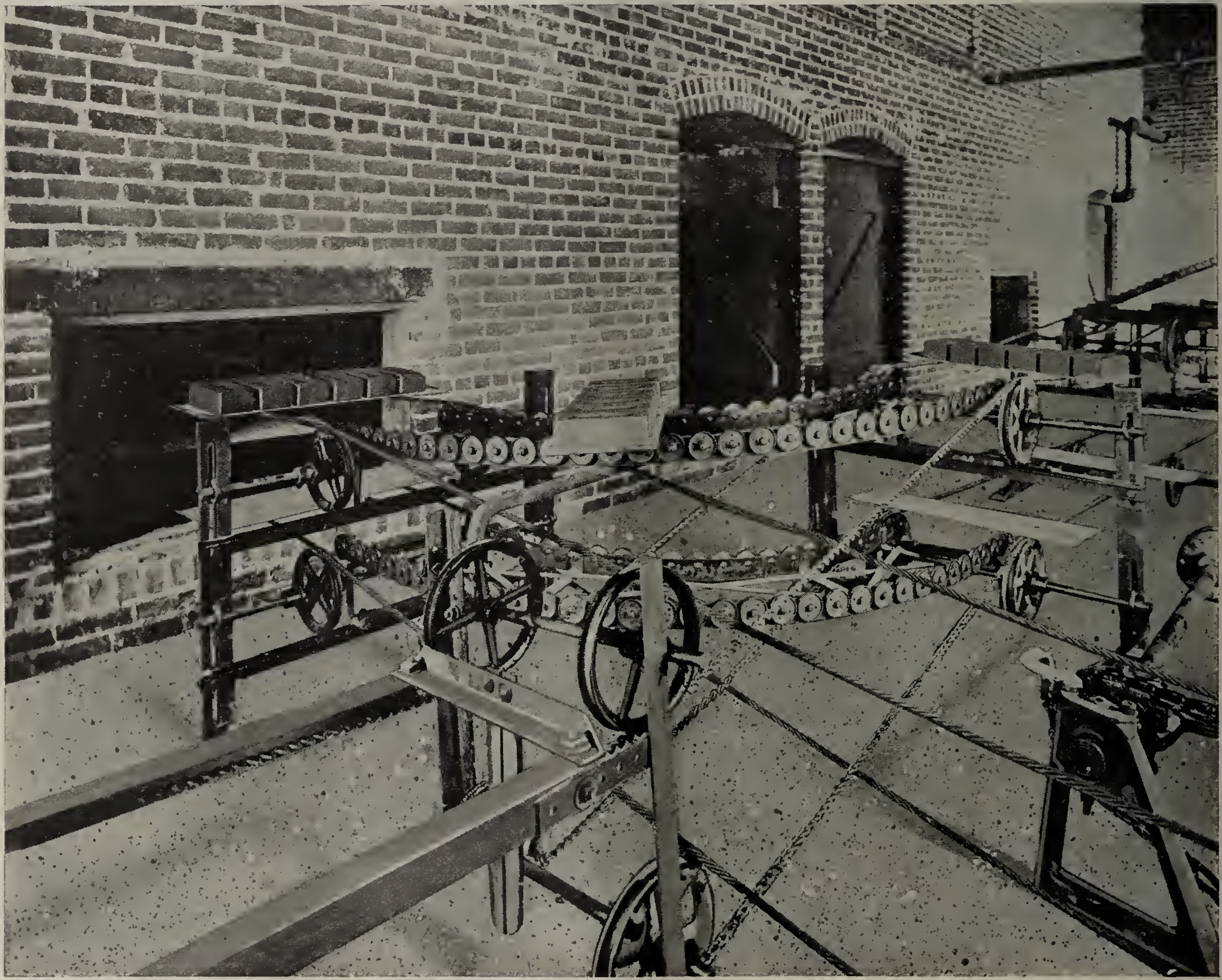
WHAT ONE OF OUR MANY SATISFIED CUSTOMERS HAS TO SAY.

Wellington Machine Co.,
Wellington, Ohio.

Have found your Dryer a **grand success.** We are having **no trouble** and are actually drying brick in this Dryer that **does not cost us a cent.** The Wellington Dryer is one of the **best on the market.** **THE OHIO BRICK CO.,**
A. R. Kuhlman, Mgr., Toledo, Ohio.
June 29, 1915.

ASK ANY OF THE FOLLOWING REPRESENTATIVE BRICK COMPANIES:

Barkwill Brick Co., Cleveland	120,000 capacity	Owen Hatten Brick Mfr., Philadelphia	25,000 capacity
American Bldg. Brick Co., Cleveland	30,000 capacity	Thornton Bros., Rudyard, Mich.	15,000 capacity
Collingwood Brick Co., Toledo	35,000 capacity	Ithaca Brick & Tile Co., Ithaca, N. Y.	30,000 capacity
Ohio Brick Co., Toledo	35,000 capacity	Mercier-Bryan-Larkins Brick Co., Detroit	60,000 capacity
Walker & Frank Brick Co., Detroit	35,000 capacity	Cook & Brown Lime Co., Oshkosh, Wis.	40,000 capacity
Farr Brick Co., Cleveland, H plant	120,000 capacity	J. S. Haggerty, Detroit	60,000 capacity
Standard Brick Co., Cleveland	120,000 capacity	F. Seitter's Sons Co., Philadelphia, Pa.	60,000 capacity

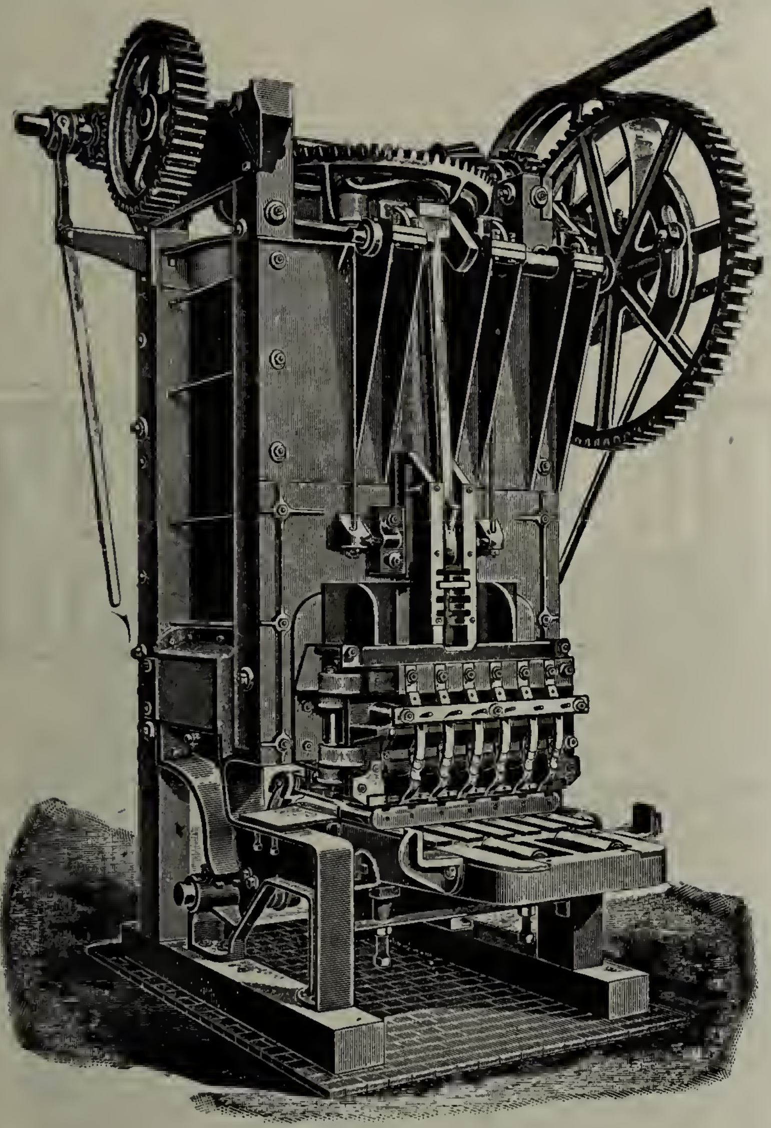


Cross Conveyor With Gravity Curves, and Brick Entering Dryer Tunnel.

The Wellington Machine Company

Wellington, Ohio

"New Haven"
Brick Machines



Soft Clay Brick Machines Are the Only Kind We Build and We Build Them Well. Stout Shafts, Long Bearings, Large Oil Holes, Strong Gears, Steel Liners and Other Details in Proportion.

The Eastern Machinery Co.
New Haven, Conn.

JOIN THE

BOOST BUILD WITH BRICK **BOOST**

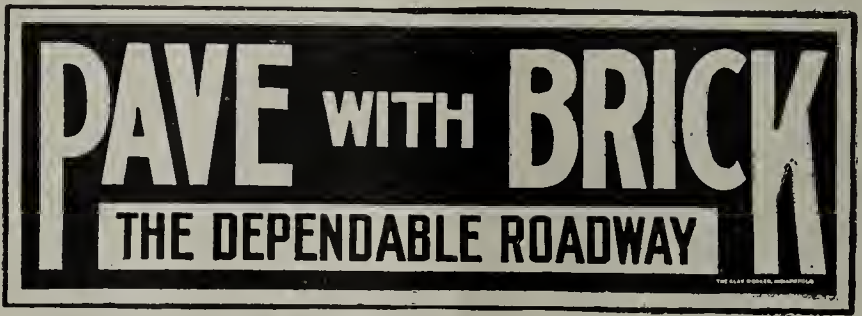
CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

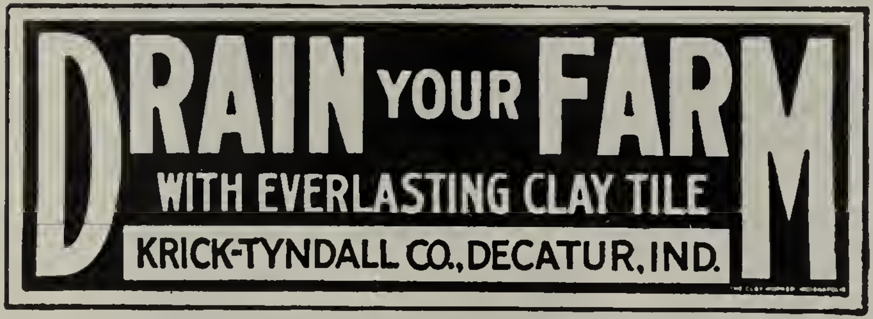
THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

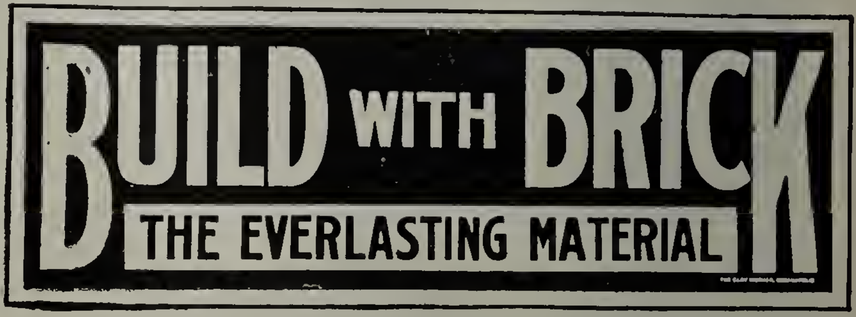


It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.



Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $5.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $6.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.



T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

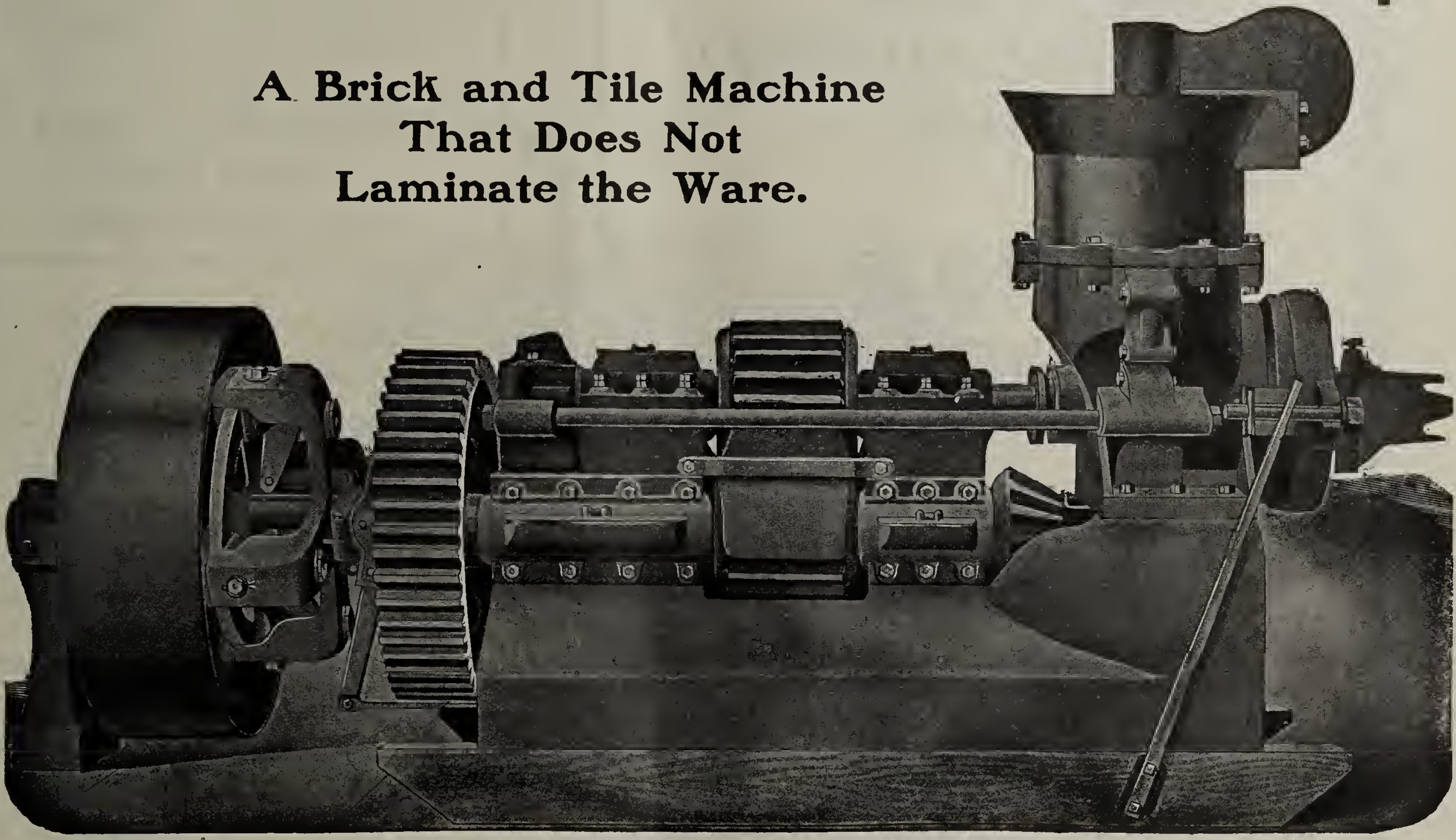
(Cross out the items not wanted, fill in and mail us the coupon.)

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

**A Brick and Tile Machine
That Does Not
Laminate the Ware.**



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

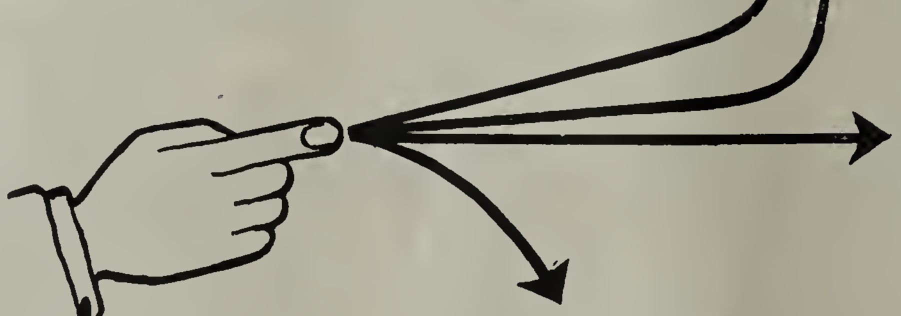
THE WALLACE MFG. CO.

FRANKFORT, IND.

"WHOSE MACHINERY SHALL WE BUY?"

DO YOU KNOW WHERE BRICK MACHINERY IS MADE?

THEN NOTE THE SIGNIFICANCE



In and About
Wellsville, Ohio,
STEVENSON'S HOME
are
25 CLAY PLANTS
and **all**
STEVENSON'S
MACHINERY.

In PENNSYLVANIA
the
STEVENSON PLANTS
are about **2 to 1**
of any other make.

In TORONTO, O.,
Territory
90 Per Cent of the
plants are
STEVENSONS.

In AKRON, O., Territory
are the two great concerns
THE ROBINSON CLAY PRODUCT CO.
and
THE AMERICAN SEWER PIPE CO.
also
THE BUCKEYE SEWER PIPE CO.
THE GRANITE CLAY CO.
THE EVANS CLAY MFG. CO.
THE MAURICE A. KNIGHT CO.
THE MURRAY BRICK CO.
THE JOHN KLINE CO.
and then some, and
ALL STEVENSONS.

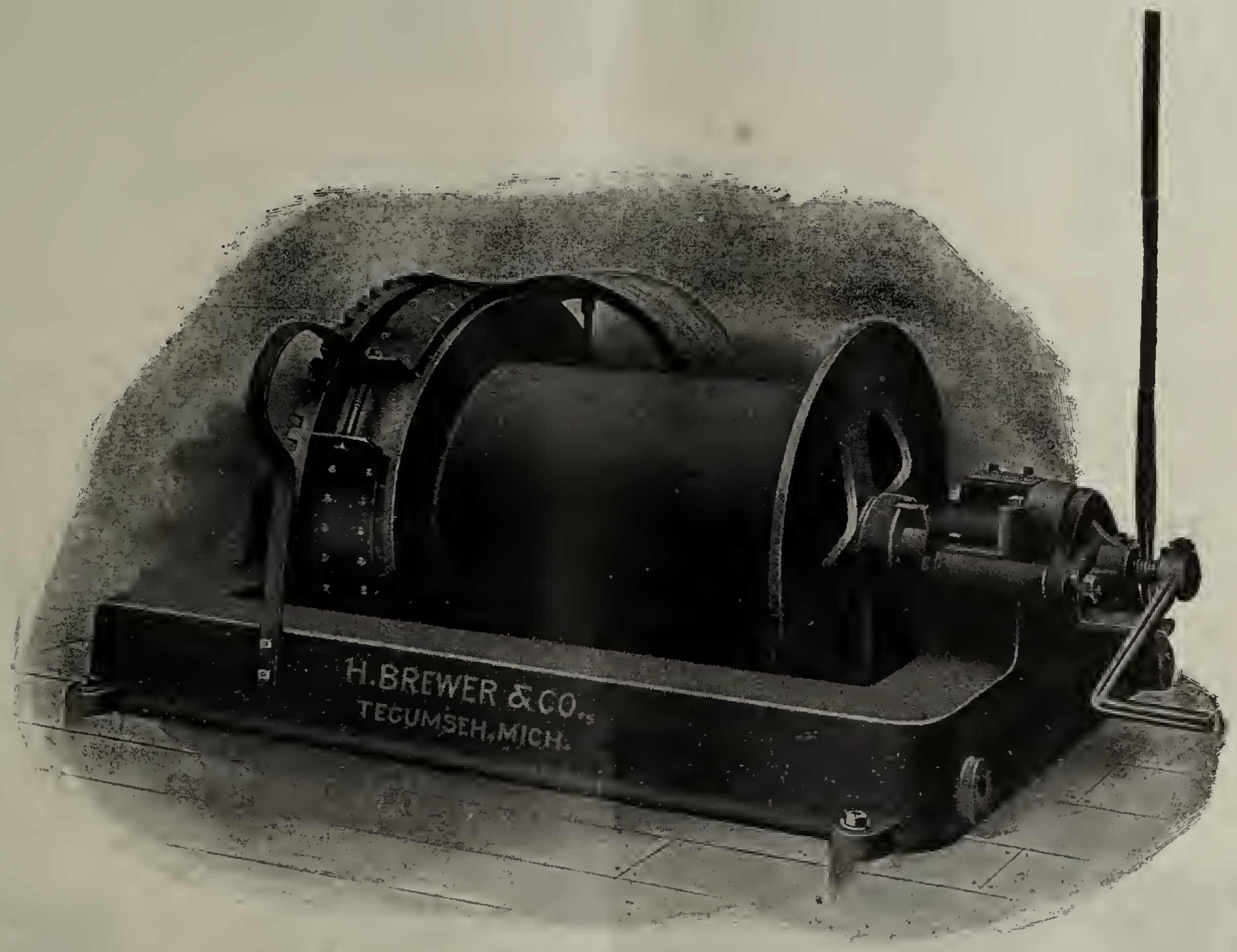
Write for Stevenson's
Catalogue, just out,
illustrating and describing
their great new
10-Foot Dry Pan
and 9-foot Duplex
Wet Pan
and many other
labor-saving devices.

WHAT'S THE ANSWER?

IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD

HOISTS

You can buy a Brewer Hoist without buying trouble with it. It will keep on hoisting without any coaxing. We have spur-geared hoists, bevel-geared hoists, spur-friction hoists and bevel-friction hoists. Large ones and small ones and all of them **good.**



This is a Heavy Bevel-Geared Pattern

It is No. 28. It weighs 3,000 pounds. The drum is 20 in. diameter, 28 in. between flanges and the flanges are 30 in. diameter. The journals are self-oiling, the gears 4 in. face, the brake band 5 in. wide. Can be made right or left hand. Illustration above is left hand. It is enough of a hoist for the biggest plants, and we have smaller ones for the others.

If you ask for our catalog you will get it

H. BREWER & COMPANY, Tecumseh, Mich.

THE DEMAND

for holloware of all kinds is increasing daily. The constant finding of new uses to which it can be put, the steady education of the rural dweller to the advantages of burnt clay products and more particularly, his learning that he can lay up his own work has greatly augmented this demand.

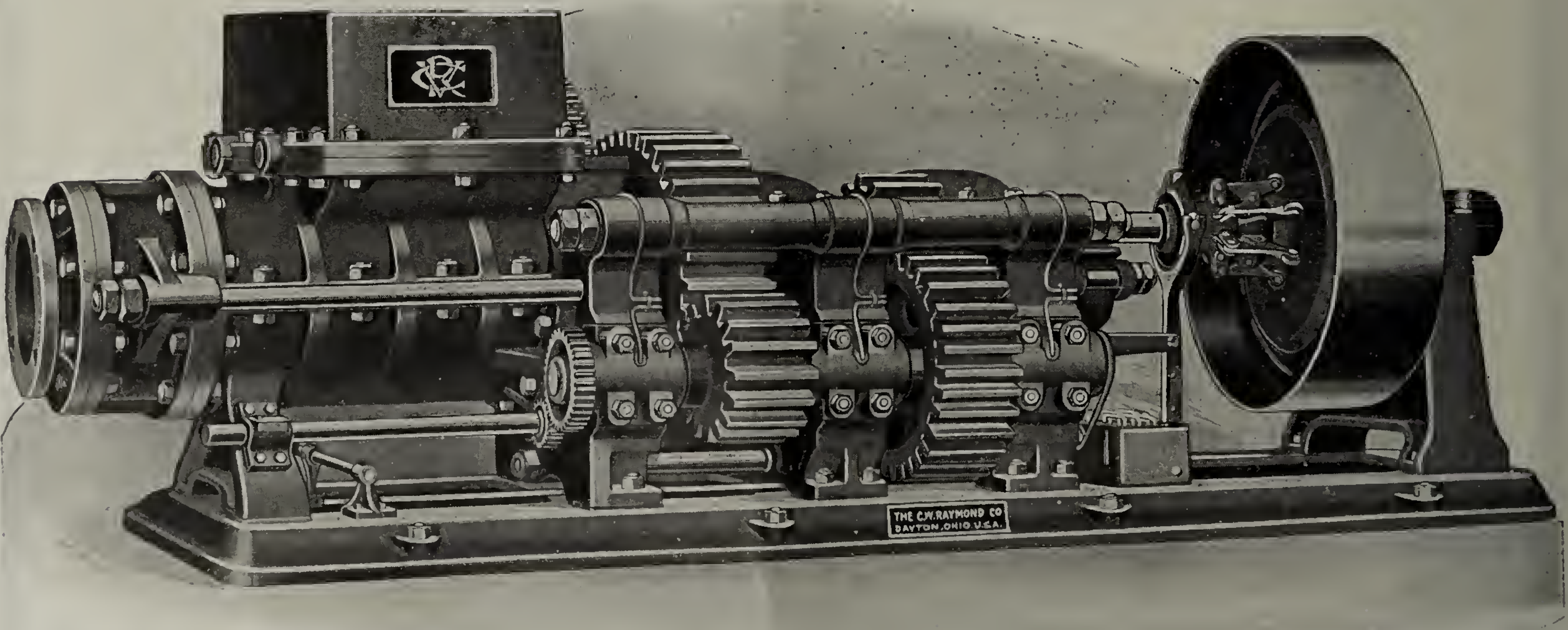
The "CVR" Holloware Machine was designed in anticipation of and in order to meet this demand and it is constructed with the exact nicety necessary to control its great strength.

It numbers among its products, drainage tile, silo block, chimney block, fireproofing shapes, partition and furring tile, hollow block and brick, Dennison tile, and, in fact, everything which may be classed as holloware.

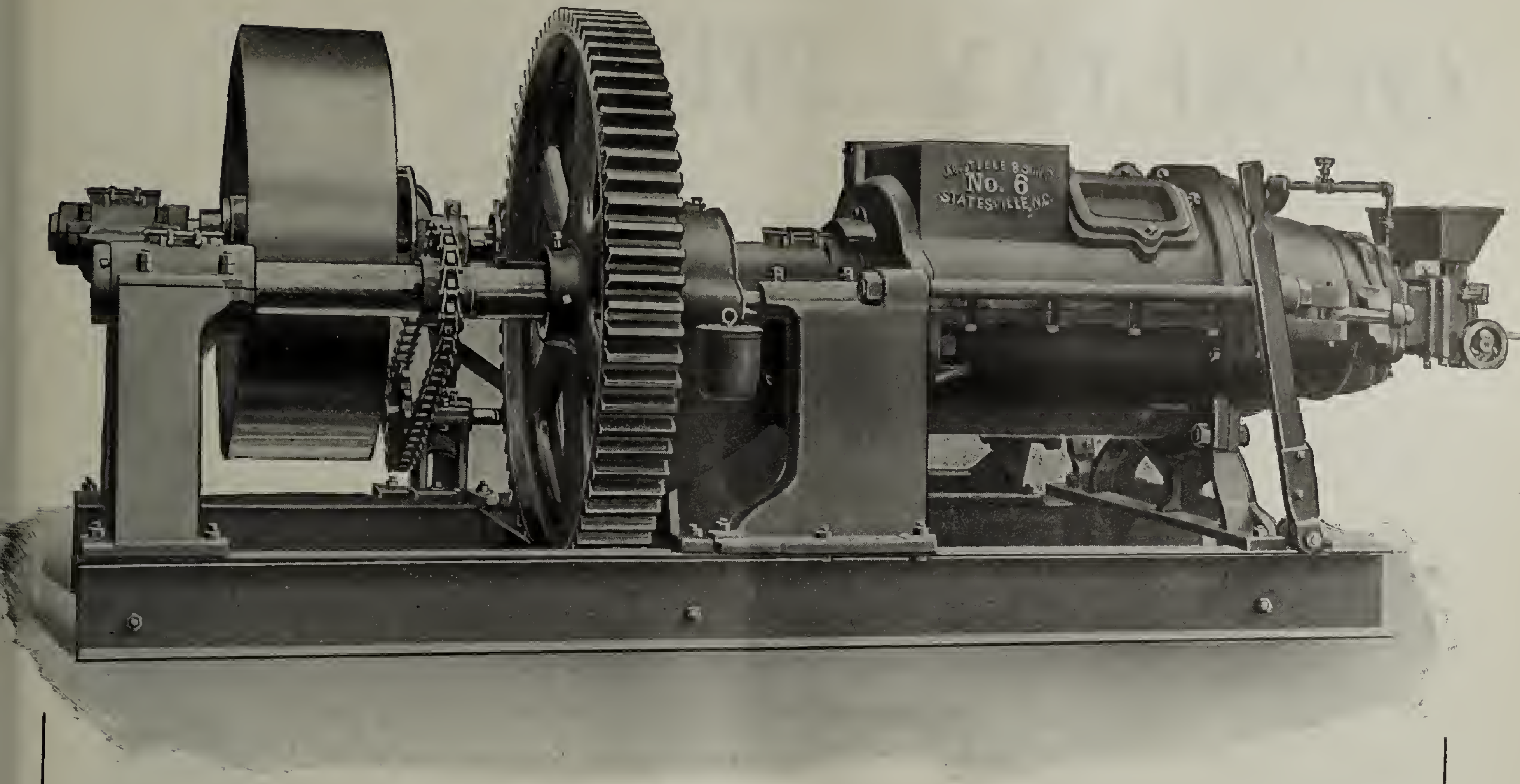
We will gladly enter into the details of its construction with you and its value to you for your own purposes, and we offer you all our facilities which, among other things, will tell you just what you can do with the clay which you have available.

Write us **now** for anything you wish to know.

INTERNATIONAL CLAY MACHINERY CO.
Dayton, Ohio
U. S. A.
Successors to The C. W. Raymond Co.



The "C V R" Holloware Machine.



(HOUSING REMOVED)

No. 6 Brick Machine, Capacity 50,000 to 150,000

A brick machine of largest capacity with single gear driving mechanism of new and improved design.

Tested for hours at a speed of 45 revolutions per minute of the auger shaft. Remember, engine speed and auger shaft speed are fixed speeds, and the less transmitting appliances between them, the less power required.

This machine has only two gears and four bearings—a reduction of three bearings, two gears and one shaft, as compared with most machines of large size.

The bearings are very large—from 4½ in. x 15 in. to 9 in. x 18 in.

The friction clutch pulley runs loose on a 7⅝ in. x 18 in. bearing.

The gear is very **large**, thereby reducing tooth load and side strain on bearings to a minimum; therefore reducing power required, wear and tear to a minimum.

Gears are cut, pinion being steel. Housed and run in oil bath.

Thrust bearing of most approved design, in front of gear; less than half frame. Outer end of auger shaft supported on out-board stand, thereby getting distance between bearings, and again reducing side strain and friction.

Sills are very heavy "I" beams with heavy channel for side strain.

Machine can be taken to pieces without elevating any part; will run **equally** well in either direction.

Cutter driving mechanism entirely separated from more important wearing parts, and get any speed in either direction.

Standard auger shaft for brick made of steel, 9½ in. in diameter, with inserted adjustable steel knives, and renewable wearing surface or shell. Also equipped with a system of continuous augers and bushings, telescoping mouthpiece, etc., for any kind of hollow ware. In this case, the shell is left off and knives fit over shaft.

A close examination will reveal many interesting points that we have not space to mention.

For further information address

J. C. STEELE & SONS

STATESVILLE, N. C.

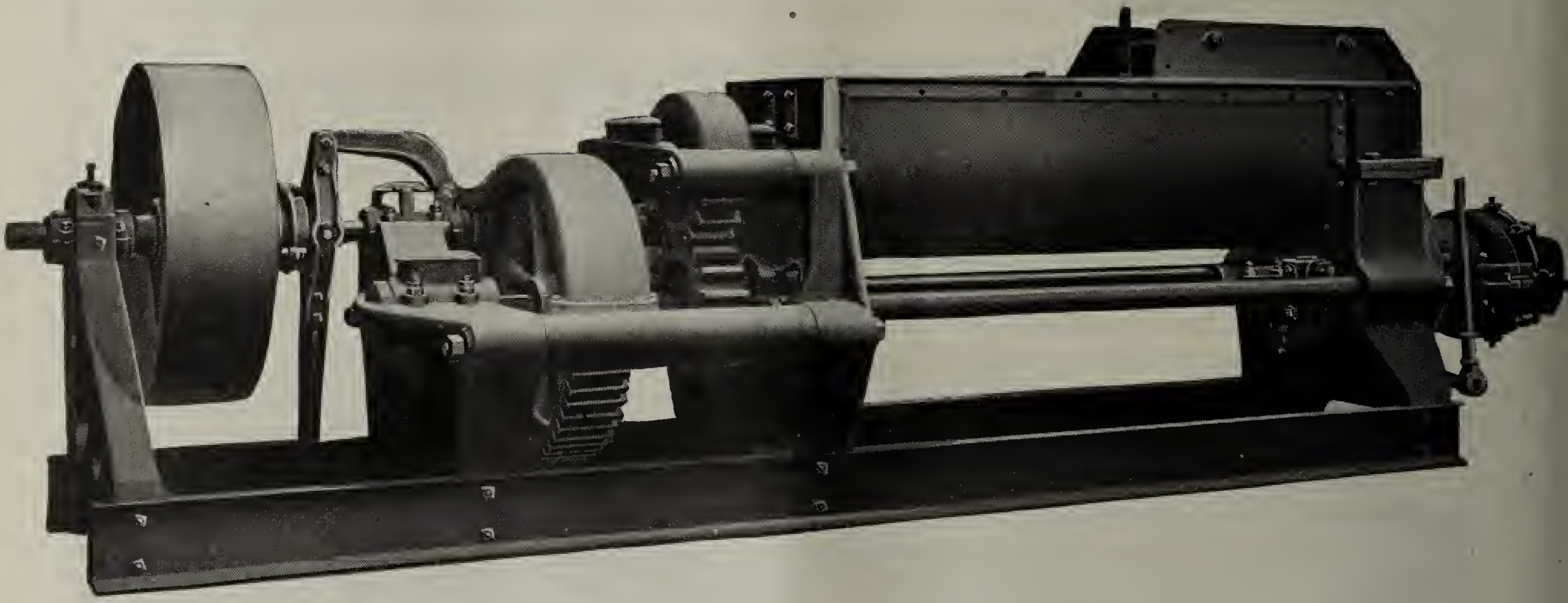
Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

QUALITY TILE

In the manufacture of tile, where the die opening is partially obstructed by the cores and core-bridges, offering considerable resistance to the flow of clay, this Union Machine with its **positive forced feed** has a decided advantage.

Then, too, being an auger machine and a pug mill in one construction, it is less expensive to install and more economical to operate.

It is an ideal tile machine with every feature necessary to the economical production of **quality** tile.



Model "KD" Union Brick and Tile Machine

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For
Sixty-Three
Years
The Name

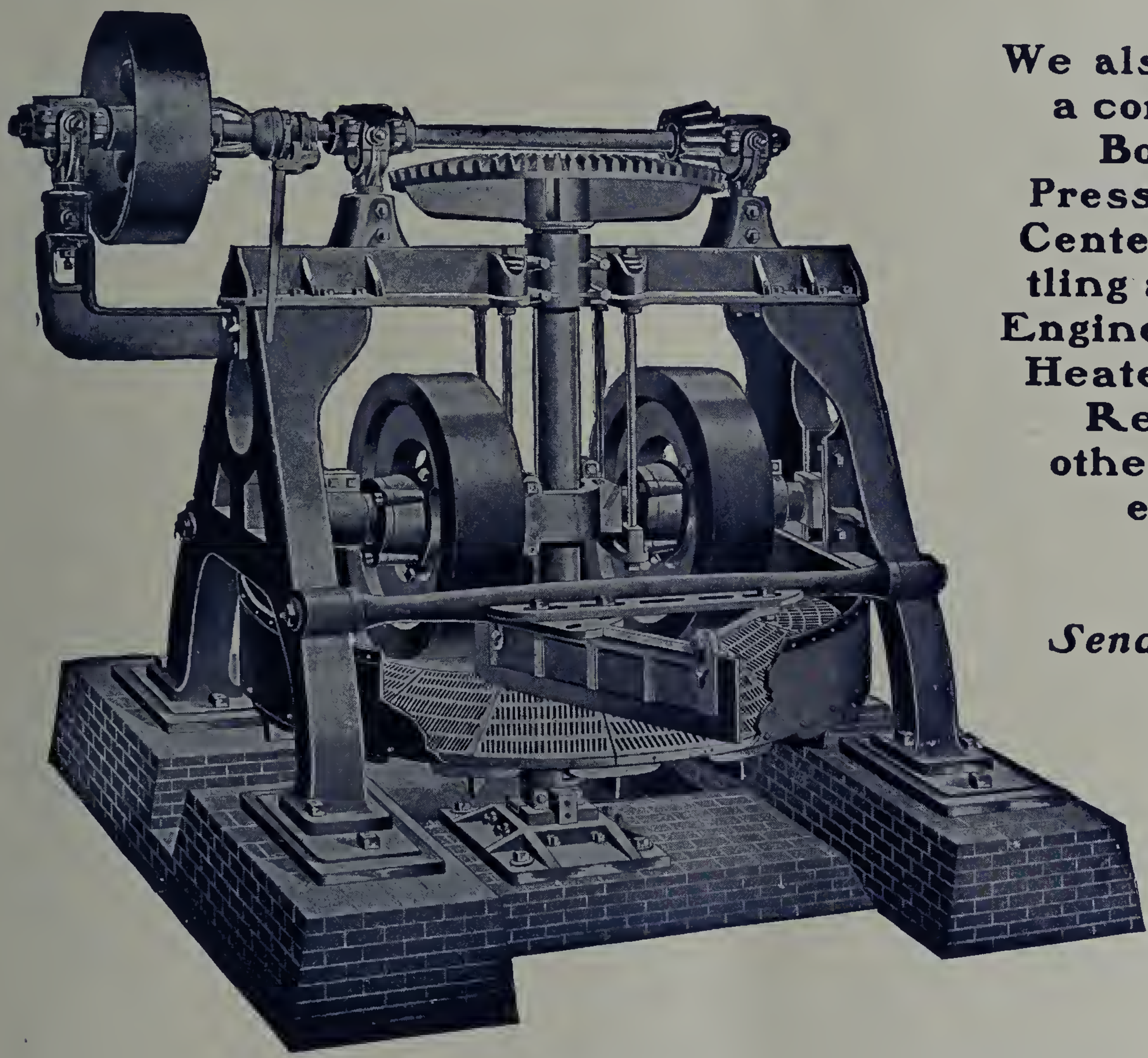
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



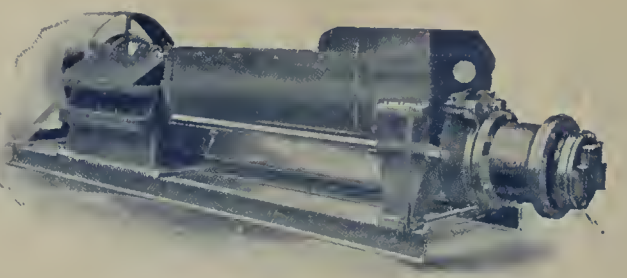
**We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.**

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.



The Wise Man of FATE

The Fate
Special Premier Machine
Will Enable YOU to Make Perfect Hollow Ware and Accomplish this at a Living Profit

Failure to make merchantable hollow ware may be attributed to the machine as often as to the clay or to the man that manipulates the clay.

Makeshift machinery won't do it. Hollow ware machines must be HOLLOW ware machines, and this is WHY the Fate Special Premier Hollow Ware Machine is making a profitable product out of a clay that is declared to be difficult to handle.

"The Fate Special Premier"
Will Make Hollow Ware at a Living Profit, Because:

It has the proper mixing chamber with the specially designed knives to give just the right mixture to the clay—absolutely necessary to the manufacture of salable hollow ware.

It has the proper "force" to the clay to enable it to fill out all the mold and deliver to the off-bearing belt a perfectly made ware.

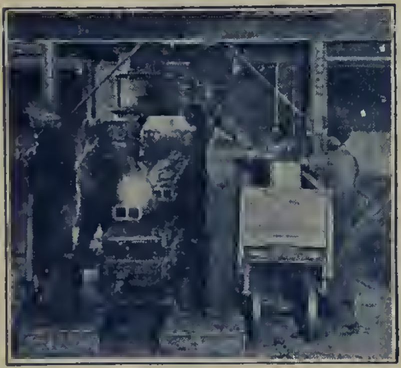
It has the properly designed dies.

It has stability.

It has durability.

It has the maximum of productiveness at the minimum of cost.

The Clay Product Co., Brazil, Ind.
Proves This Statement to be TRUE!



This concern—one of the largest and most successful clay product plants in the United States, is making hollow ware with a "Fate Special Premier Hollow Ware Machine."

Two of these big "Premiers" are used on making conduit ware—one of the most difficult of wares to manufacture, because of the exacting conditions.

Not only must this ware be symmetrical, both inside and out, but the ends of the ducts must be perpendicular to sides. Then, too, there must be no projections or defects which will weaken the conduits, or which will prove an obstacle in pulling cables through the ducts. All duct holes must be well centered and all duct walls must be of a specific thickness.

The multiple ducts must have dowell pinholes for perfect alignment so that each hole will fit perfectly and be interchangeable in all parts.

No other machine will give such a uniform ware as the "Fate Special Premier" and, at the same time permit a living profit, and the Clay Product Company has proven this to their own satisfaction.

You Can Do the Same

If the "Fate Special Premier" will make **conduit** ware successfully it certainly can make any hollow ware at a profit.

We have a special bulletin on hollow ware machinery—why not send for it and investigate a little?

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

☐ Auger Brick Machinery.
☐ Hollow Ware Machinery.
☐ Conveyors.
☐ Crushers.
☐ Elevators.
☐ Clay Feeders.
☐ Disintegrators.
☐ Pug Mills.
☐ Clay Testing.
☐ Full Equipment.
☐ Industrial Locomotives.
☐ Drain Tile Machinery.

Name ....

Town.................................... State...........

We Make Everything For the Clayworker

"The House of Fate" manufactures everything a clayworker uses—and every machine or device is designed for its special purpose just as are "Fate Special Premier Hollow Ware Machines."

There are no makeshifts in Fate machinery—no patched up machines "to answer a purpose."

Let Fate's Experience Help You Our various departments are at your service in any of the problems that confront you.

Give us a frank statement of your needs or requirements and let us make you a proposal. You do not have to buy or agree to buy anything.

Use the Coupon At the left there is a coupon. Check off the items you are interested in and stick this coupon to your letter head, or to a slip of paper, and mail it today.

The J. D. Fate Co.
242 Riggs Avenue PLYMOUTH, OHIO

The Wise Man of FATE

"The Plymouth" Will Do YOUR Haulage Cheaper and Better than Man, Horse, Compressed Air, Steam, Electric or ANY OTHER Gasoline Locomotive.

This statement is not an idle one. It is made as a positive statement of FACT and broad as it may SEEM to you, we give you the assurance that it is backed up by the PROOF of "Plymouth" users and that we are going to convince you by showing you this proof.

"The Plymouth"

Will Do Your Haulage Cheaper and Better, Because—

It Uses Gasoline—the most economical of ALL Fuels.

It uses the "Plymouth" Friction Drive, which gives MORE power, per unit of energy, a greater FLEXIBILITY of operation, a LIMITLESS number of speeds—the same forward, the same backward, a quicker PICK-UP of loads, and a greater freedom from JERKS and STRAINS, than does ANY OTHER system of transmission.

It uses a HEAVIER frame, which gives it greater TRACTION power and enables it to PULL MORE per horse power, and to take greater and higher GRADES than any other locomotive of the SAME horse power.

Frank Fleigle, Morrisonville, Illinois

Says This Statement is TRUE!

This is Mr. Fleigle's 8-year-old son, who operates "The Plymouth."

Mr. Fleigle has had a "Plymouth" in actual use about 18 months, the locomotive replacing dump cars drawn by horses, and because of the short haul he has (300 feet) and the 10 per cent grade he has to negotiate, we select his case as a fair one for evidence.

Certainly, if "The Plymouth" can be of a profit to a small plant like that operated by Mr. Fleigle, it ought to be profitable to a larger plant. Read what he says:

"We find that the 'Plymouth' is costing us for fuel about HALF to feed the two horses we formerly had.

"At one time we used a drum hoist with electric motor, but this required a man with a horse to set the empty car in the pit, and we have proven that the 'Plymouth' not only is cheaper than the horse and dump cars, but also cheaper than the hoist.

"My 8-year-old son runs the 'Plymouth,' easily starting and stopping without trouble, even on a 10 per cent grade. Our repair bills for the past 18 months have been less than $1. Our candid opinion of the 'Plymouth' as a load-pulling locomotive is that it cannot be beaten."

We Have a Big Book of "Plymouth Facts"

You ought to learn all about the "Plymouth" because it may open your way to a real profit in your business.

We have a book which tells all about the "Plymouth," and also by illustration and letters from users shows just what it is doing for other clayworkers.

Get ALL the Truth

Send for this book—a copy to you for the asking, and then act as judge. It is full of FACTS—and it is FREE.

Send Coupon

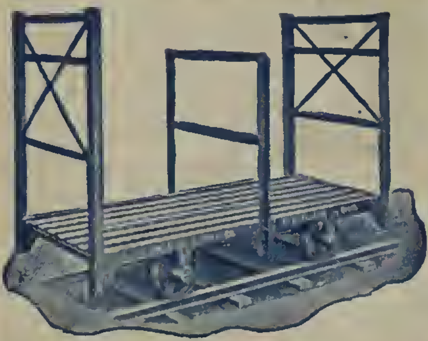
At the right there is a coupon—it is placed there for YOUR convenience. Sign it, place it in a letter and mail it TO-DAY, or, if you wish, write us a letter and state just what your haulage conditions are and we will send not only the FREE book, but also make you a proposal.

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

Firm Name (Firms) ....
(Signed by)..............................
(City) ....
(Street) ....
(State) ....

The J. D. Fate Co., 242 Riggs Ave. Plymouth, Ohio

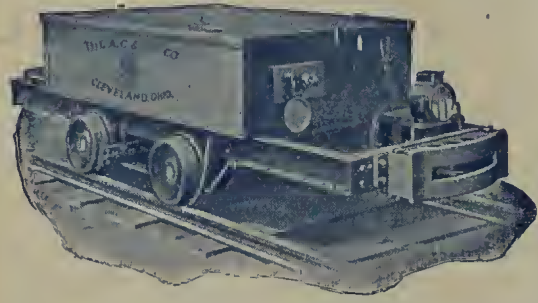


No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

ATLAS
High Efficiency
Cars and
Electric Locomotives

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.



Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information

Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

LAKEWOOD NO. 166

Dryer Cars
Rack Cars
Dump Cars

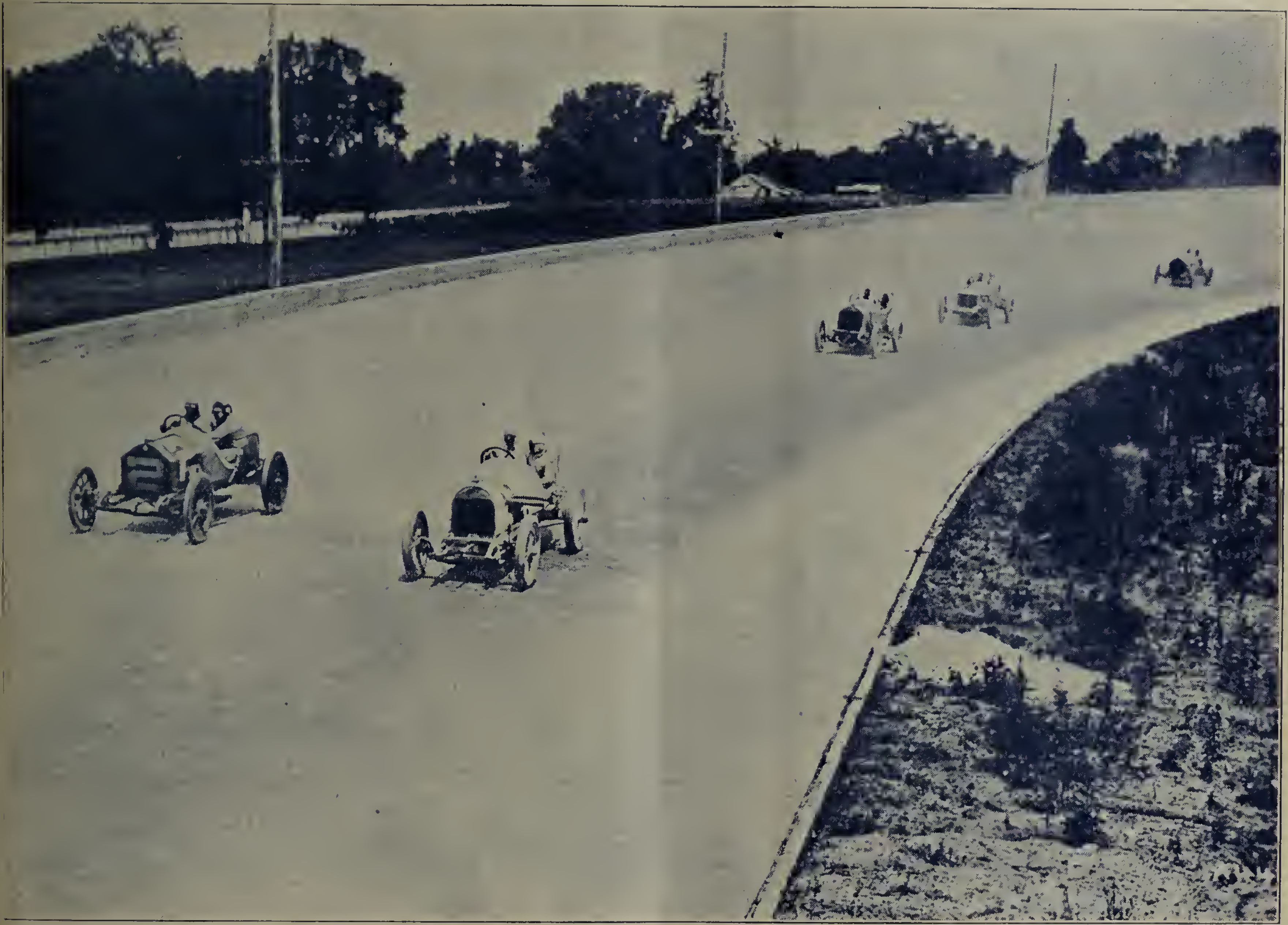
Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

Chicago: 506 S. Canal St.
Pittsburgh: 1230 Fulton Bldg.
New York: 30 Church St., Room 802.
Baltimore: Munsey Bldg.
Kansas City: N. Y. Life Bldg.

MAY, 1916

THE CLAY-WORKER



Turning Into the Home Stretch On the Indianapolis Motor Speedway, the Two=and=One=Half=Mile Brick Paved Track Where the Year's Racing Event Occurs May 30th. See Page 549.

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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BUYERS' READY REFERENCE LIST
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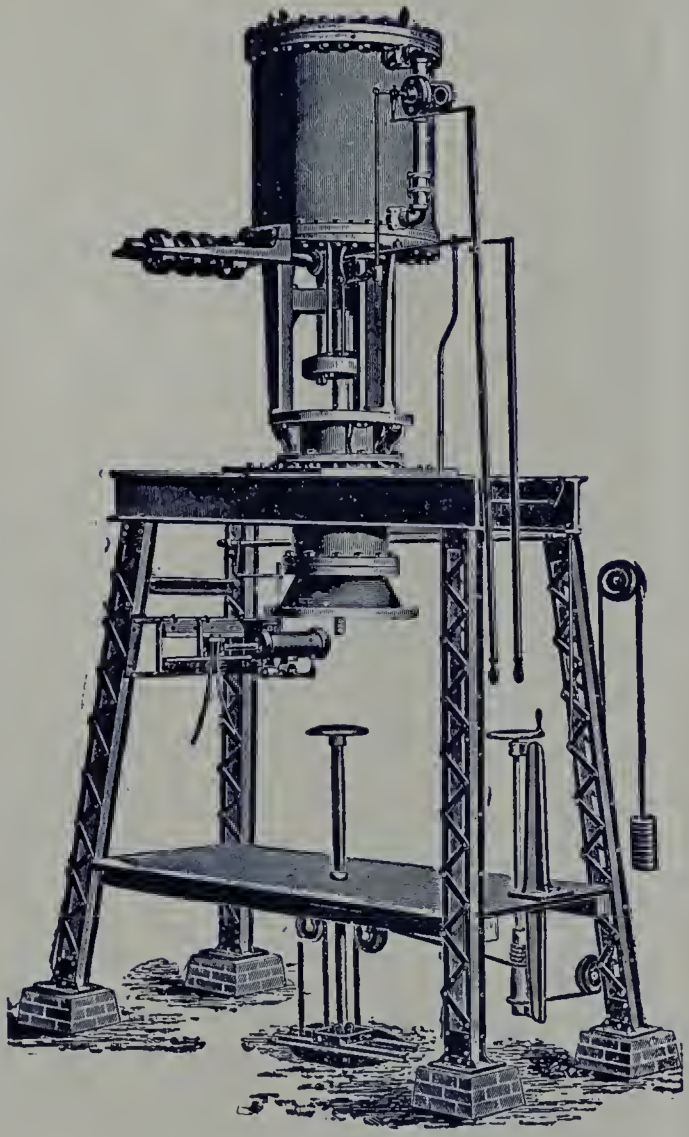
Page 625

All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.

ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC. Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.



We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

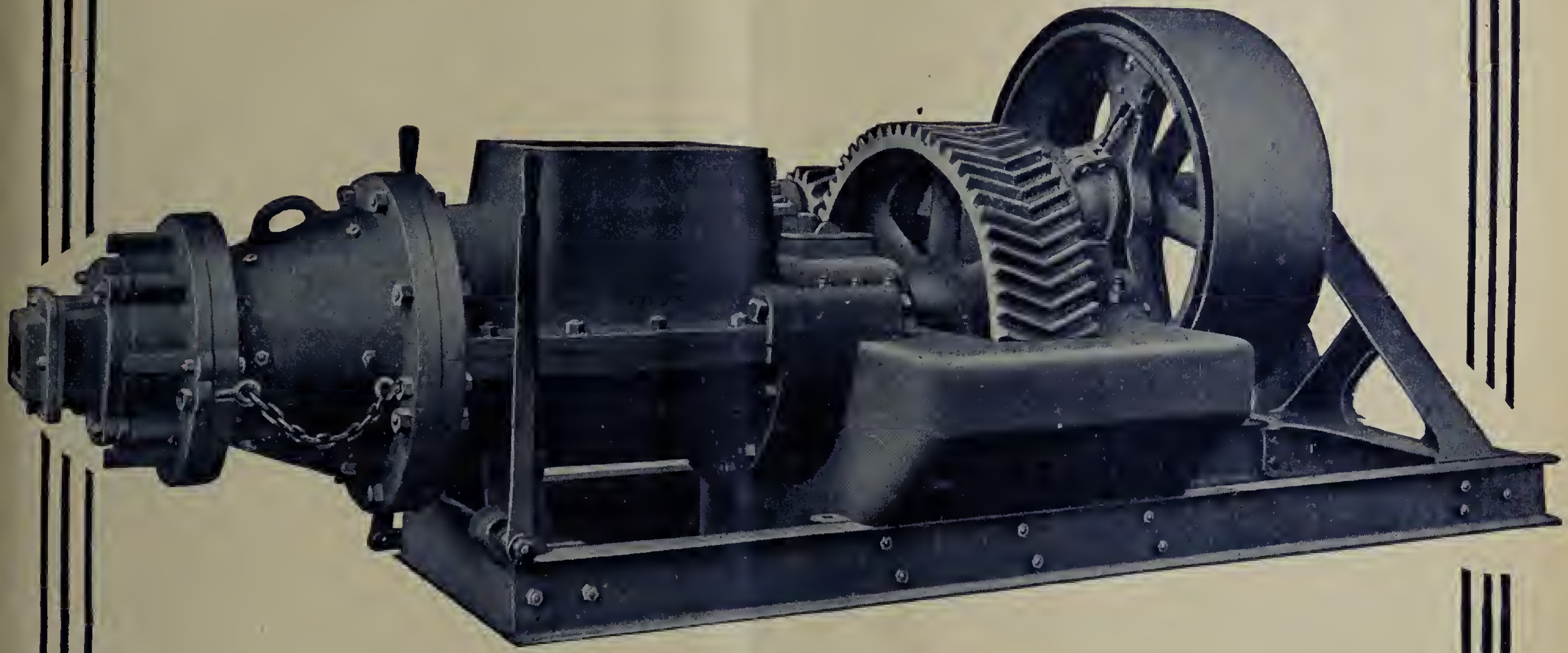
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.

THE BONNOT COMPANY

CANTON, OHIO

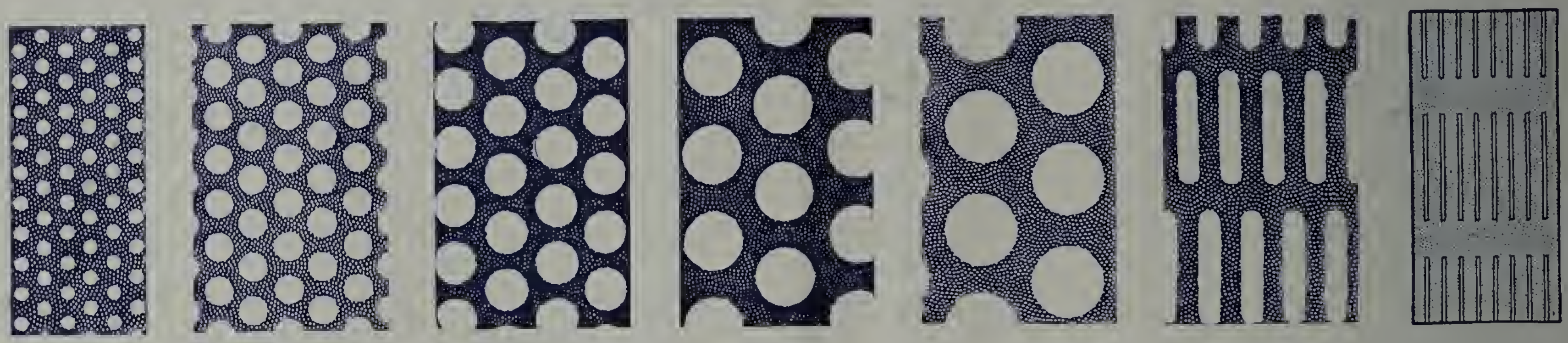
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

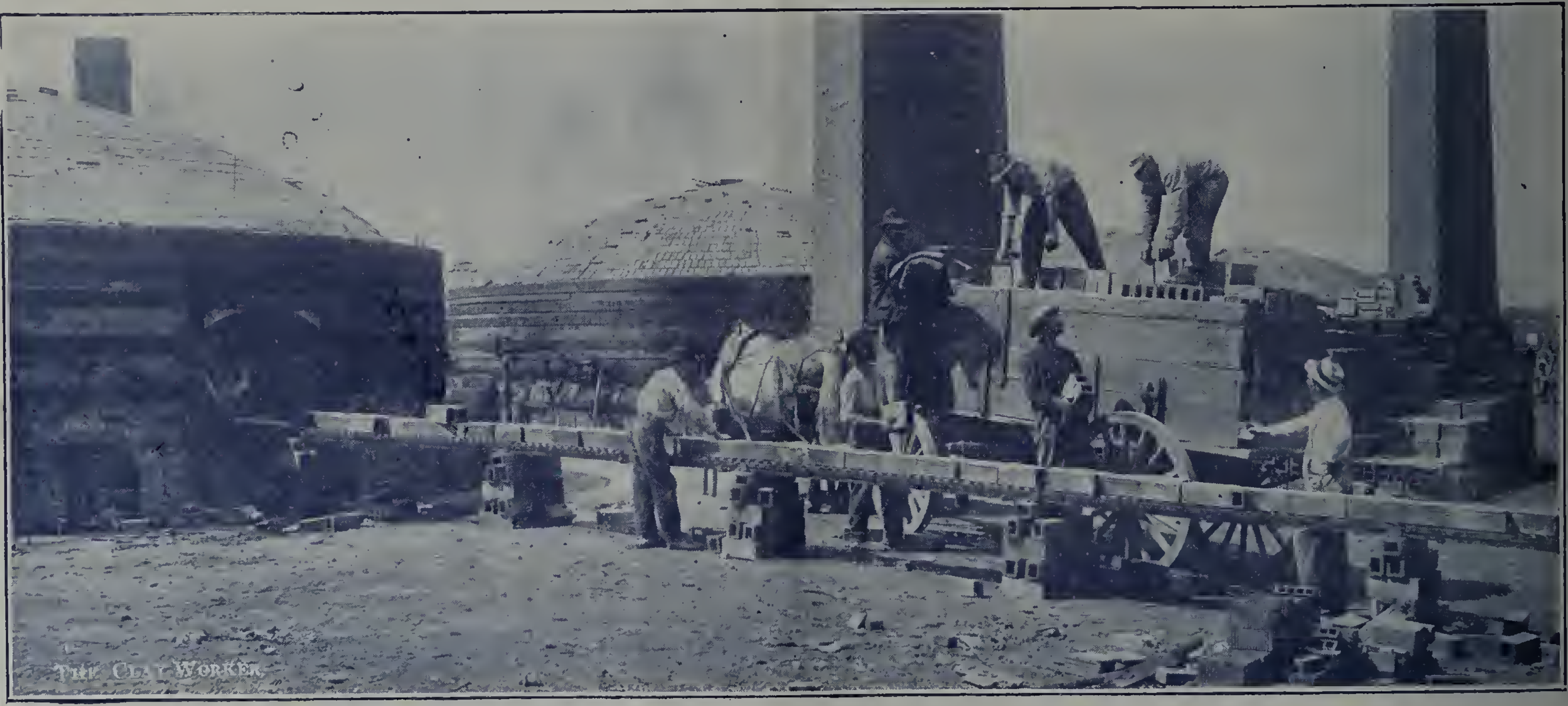
The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

Prepare for a Busy Season and a Labor Famine!

Make Yourself Independent of Your Wheeling Gang When the Rush Comes.



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Don't wait until you are in trouble before you order an outfit of Mathews Gravity Conveyers. You cannot expect us to have a system to fit your requirements all made up ready to ship the day you order it, no matter how badly you need it. We always have orders ahead of yours, and we need time—sometimes several weeks—to catch up with an accumulation of unfilled orders. Ask us now to send the nearest representative. He will tell you what you need, the cost, and get the order on file without waste of valuable time.

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TORONTO, ONT.
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MATHEWS GRAVITY CARRIER CO.
ELLWOOD CITY, PA.

RODGERS

Help "Pave with Brick"

THE ROAD TO WEALTH—paved with "FIRSTS" from

Rodgers Waste Heat Dryers,

BUT

DON'T HELP "PAVE WITH BRICK" THE ROAD TO POVERTY—paved with "SECONDS" from MISFIT DRYERS.

With the SAME MATERIAL, dried in a RODGERS DRYER—in place of a Misfit Dryer—in less time, and for less money, you can produce "FIRSTS" instead of "SECONDS"—and help "PAVE WITH BRICK"

THE ROAD TO WEALTH
instead of
THE ROAD TO POVERTY

L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
Brick Works Engineers

Largest Manufacturers of Brick Drying Equipment in the United States

General Offices and Works

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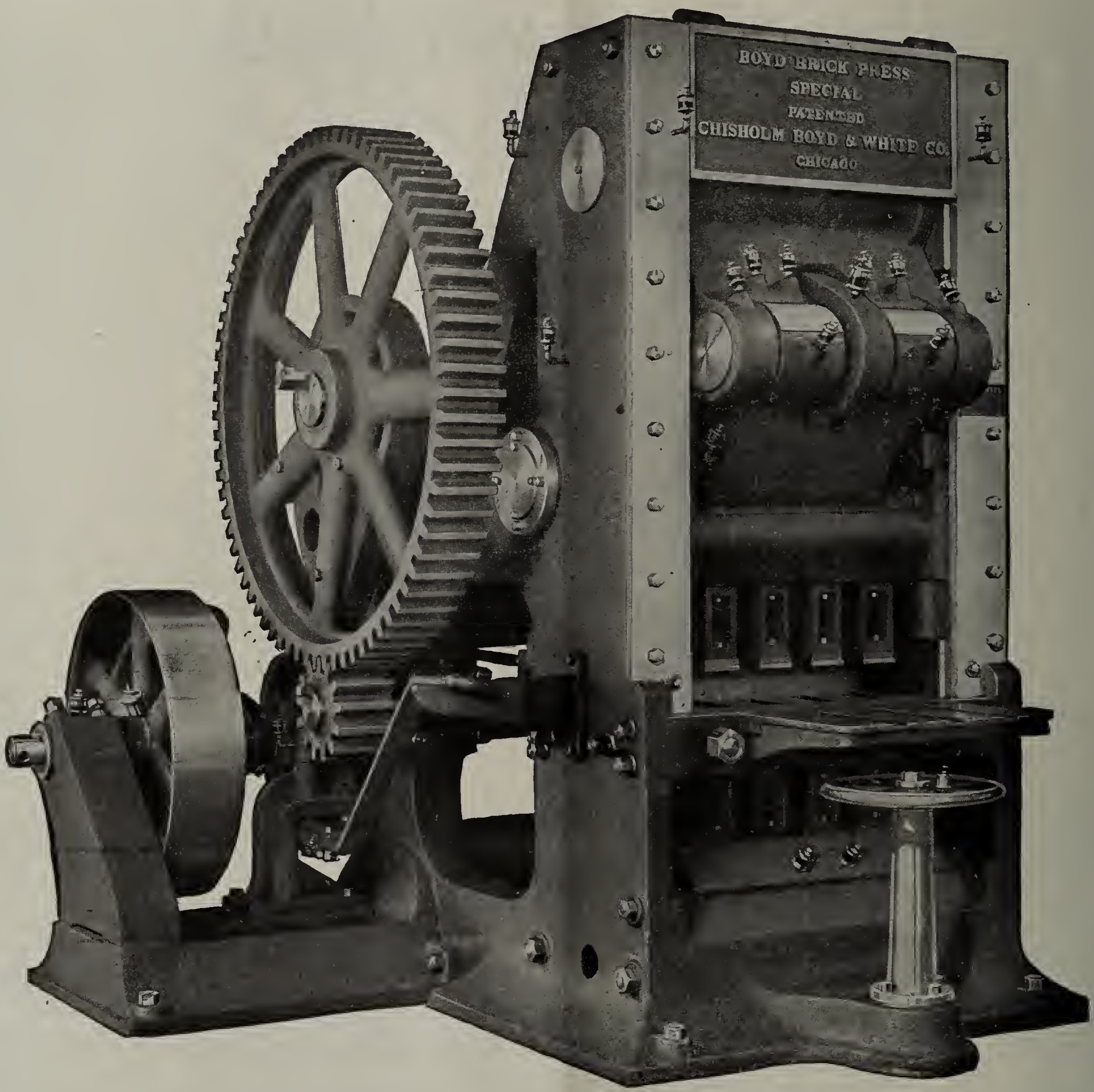
RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

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Ammeters.
The Brown Instrument Co.
Beighlee Electric Co., The.

Analysists and Chemists.
Ceramic Supply & Con. Co.
N. J. State University.

Arch Cutting Apparatus.
Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.
Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.
(See Cutting Tables.)

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Freese & Co., E. M.
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Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.
Roessler-Hasslacher Chem. Co.

Bearings, Roller.
(See Supplies.)

Belting.
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Gandy Belting Co.

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American Clay Machinery Co.
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Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

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International Clay Mach. Co.
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Trautwein Dryer & Engr. Co.

Boilers.
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Arbuckle & Co.
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Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

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Brick (Paving).
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McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
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Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

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Ceramic Supply & Con. Co.
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Potts & Co., C. & A.

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Carnell, Geo.
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Fernholtz Brick Machy. Co.
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Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
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Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
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Brick Machines (Soft Mud).
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Eastern Brick Machinery Co.
International Clay Mach. Co.
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Potts & Co., The C. A.

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Brewer & Co., The
Chambers Bros. Co.
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Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

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Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
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International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

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International Clay Mach. Co.

Brick Setting Machinery.
American Clay Machinery Co.

Buffing Machinery.
American Clay Machinery Co.

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American Blower Co.
Boss, John C.
F. W. Dennis.
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Koch, J. J.
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Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.
(See Dryer and Dumping Cars.)

Carbide Coating.
Stowell, E. R.

Castings.
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Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

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Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Clay Crushers and Pulverizers.
American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Phillips & McLaren Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clays.
American Clay Machinery Co.

Clay Dryers.
American Process Co.
Schaffer Eng. & Equip. Co.

Clay Feeders and Mixers.
American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.
(See Scrapers.)

Clay Steamers.
American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.
American Clay Machinery Co.
Fate Co., The J. D.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

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Coloring Materials.
Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.
Orton, Edward, Jr.

Consultnig Engineers.
Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.
American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.
American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.
Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Couplings.
(See Supplies.)

Cutting Tables (Brick & Tile).
American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.
American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.
(See Supplies.)

Dies.
Louisville Machine Co., The.
(See Supplies.)

Disintegrators.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.
Ceramic Supply & Con. Co.

Drain Tile Machinery.
(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.
(See Supplies.)

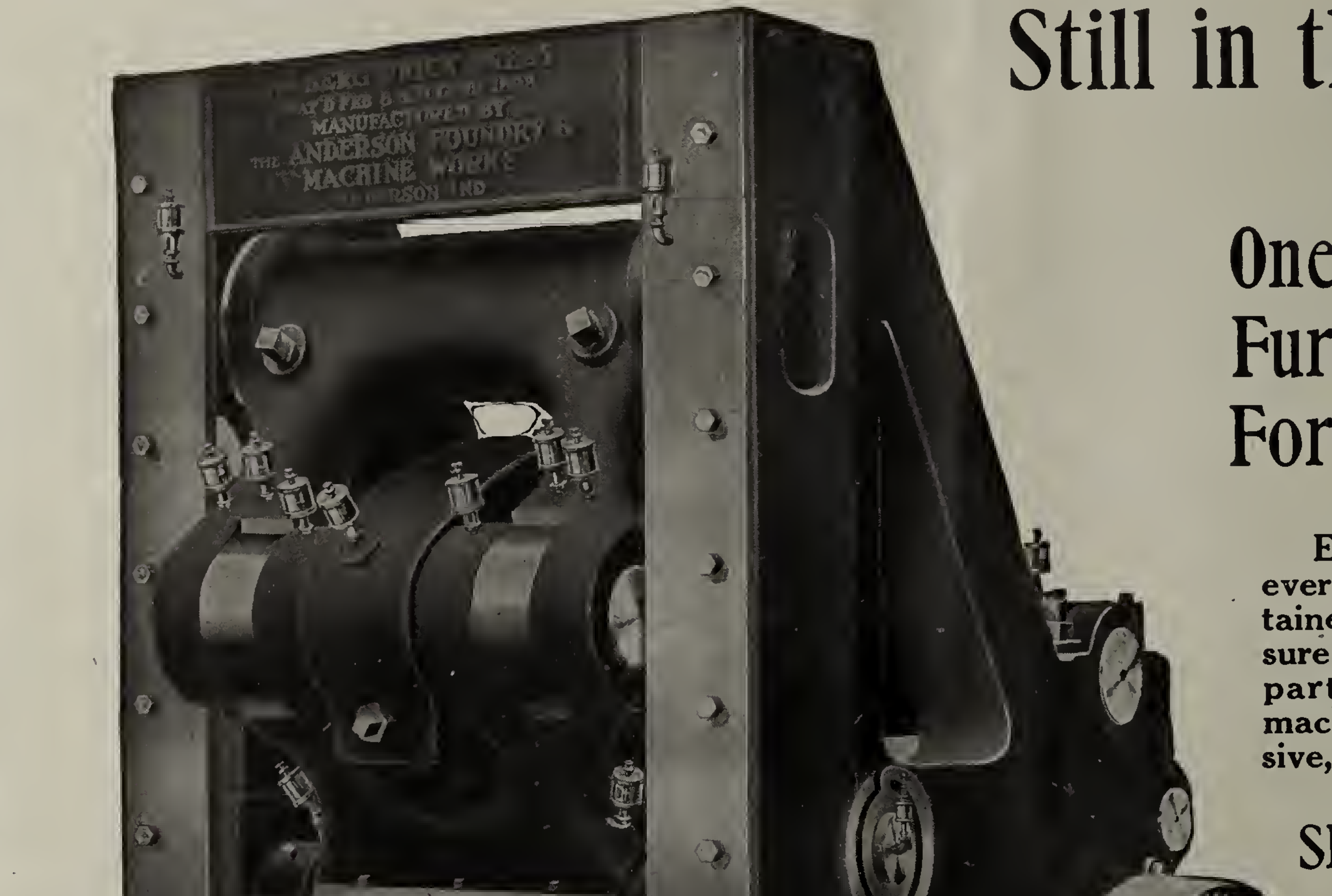
Dryers.
American Clay Machinery Co.
American Process Co.
Boss Co., John C.
Chambers Bros. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Richardson-Lovejoy Engr. Co.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

Dryer Cars.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.

(Continued on page 537.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE
FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

ANDERSON, IND.

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Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.
Wellington Machine Co.
Wilson, Thomas M.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Louisville Machine Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Beighlee Electric Co., The.
Brown Instrument Co., The
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

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American Clay Machinery Co.
Beighlee Electric Co., The.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

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(See Conveyors.)

Engines.

American Clay Machinery Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Lovejoy, Ellis.
Rodgers Engr. Co., The L. E.
Schaffer Eng. & Equip. Co.
Trautwein Dryer & Engr. Co.

Fans.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

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American Clay Machinery Co.
International Clay Mach. Co.
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Parker-Russell M. & M. Co.

Floor Tile.

Chicago Ret. & Fire Brick Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

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Raymond Co., The C. W.

Gears.

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Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

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Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.

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Mathews Gravity Carrier Co.
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American Clay Machinery Co.

Grouter.

Marsh-Capron Mfg. Co.

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Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Stevenson & Co.

Hand Winch.

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Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Illustrators.

Lamb, J. & R.

Insurance.

Mantel, Tile and Grate Monthly.

Jacks.

(See Supplies.)

(Continued on page 539.)

MUELLER'S NEW AUGER BRICK MACHINERY

Auger Brick Machines of most advanced design, in capacity from 8,000 to 60,000 per day.

Horsepower Brick Machines, Hand Plunger Presses for drain tiles, hollow blocks, etc.

Smooth Roll Crushers, with two and three rolls, Break-roll Crushers for hard shale.

Pug Mills, single or double shaft, for any capacity, Automatic Feeders.

Automatic Brick, Block and Drain Tile Cutters.

Hand tables for all kinds of clay products, designers of special tables.

Complete equipment for making lockplate building blocks, coupling building blocks and other hollow wares.

ROOFING TILE MACHINERY

Revolving Presses, Trimming Presses, Hand Roofing-Tile Presses, molds in plaster or metal.
Special Double Shaft Auger Machines for roofing tiles, and mechanically lubricated dies.
Cutting tables for shingles, promenades, interlocking, Spanish tiles etc.

MUELLER BROS.

1436 Macklind Ave. (on Frisco Tracks) **ST. LOUIS, MO.**

Trautwein
DRYERS

What Trautwein Service Means---

As manufacturers of Dryers and Dryer Equipment we are prepared to study the conditions at your plant—to make a commercial test of your clay to determine what method of drying will best suit your needs—

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Boss Co., John C.
F. W. Dennis.
Hook Patent Kiln Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Ohio Kiln Co., The.
Richardson, W. D.
Schaffer Eng. Equip. Co.
Smith Co., Claude.
Swift, Edward A.
Yates, Alfred

Kilns, Doors, Castings and Frames
(See Supplies.)

Kiln Bands.
Holliday, W. J., & Co.

Kiln Floor Tile.
Chicago Ret. & Fire Brick Co.

Knives.
(See Supplies.)

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Davenport Locomotive Works.
Dewey Bros.
Fate Co., The J. D.

Manganese.
(See Coloring Materials.)

Mechanical Draft.
American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

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(See Coloring Materials.)

Molds (Brick).
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Wallace Mfg. Co.

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(See Coloring Materials.)

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Schurs Oil Burner Co.

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Ohio Galvanizing & Mfg. Co.

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(See Dry and Wet Pans.)

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(See Brick.)

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Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

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Arbuckle & Co.
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Carnell, Geo.
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Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mueller Bros.
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Steele & Sons, J. C.
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(Continued on page 540.)

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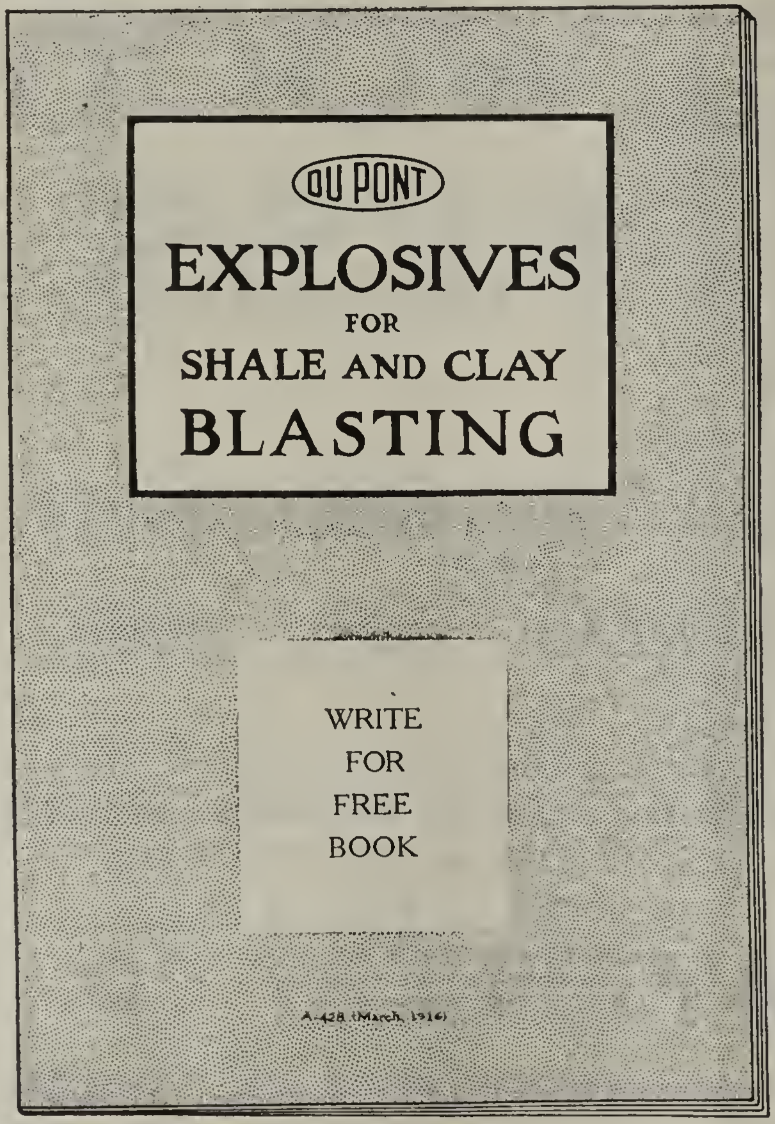

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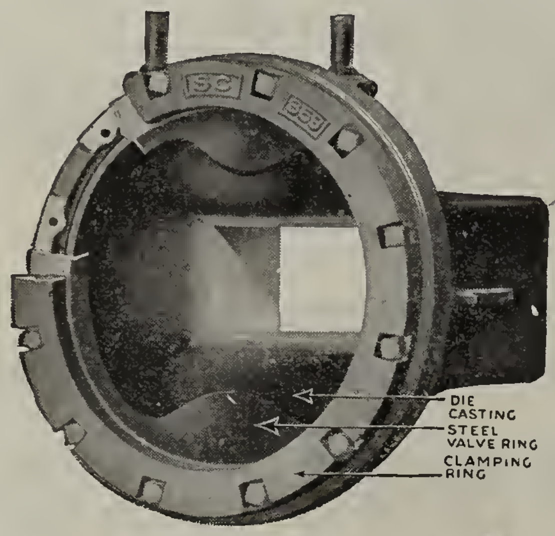

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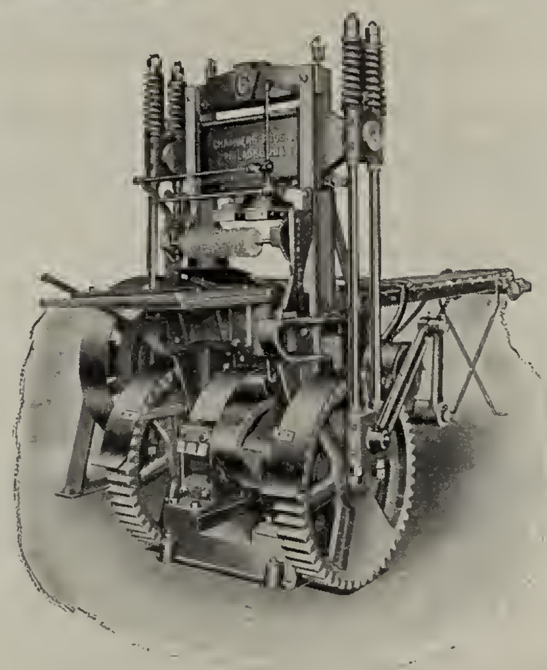

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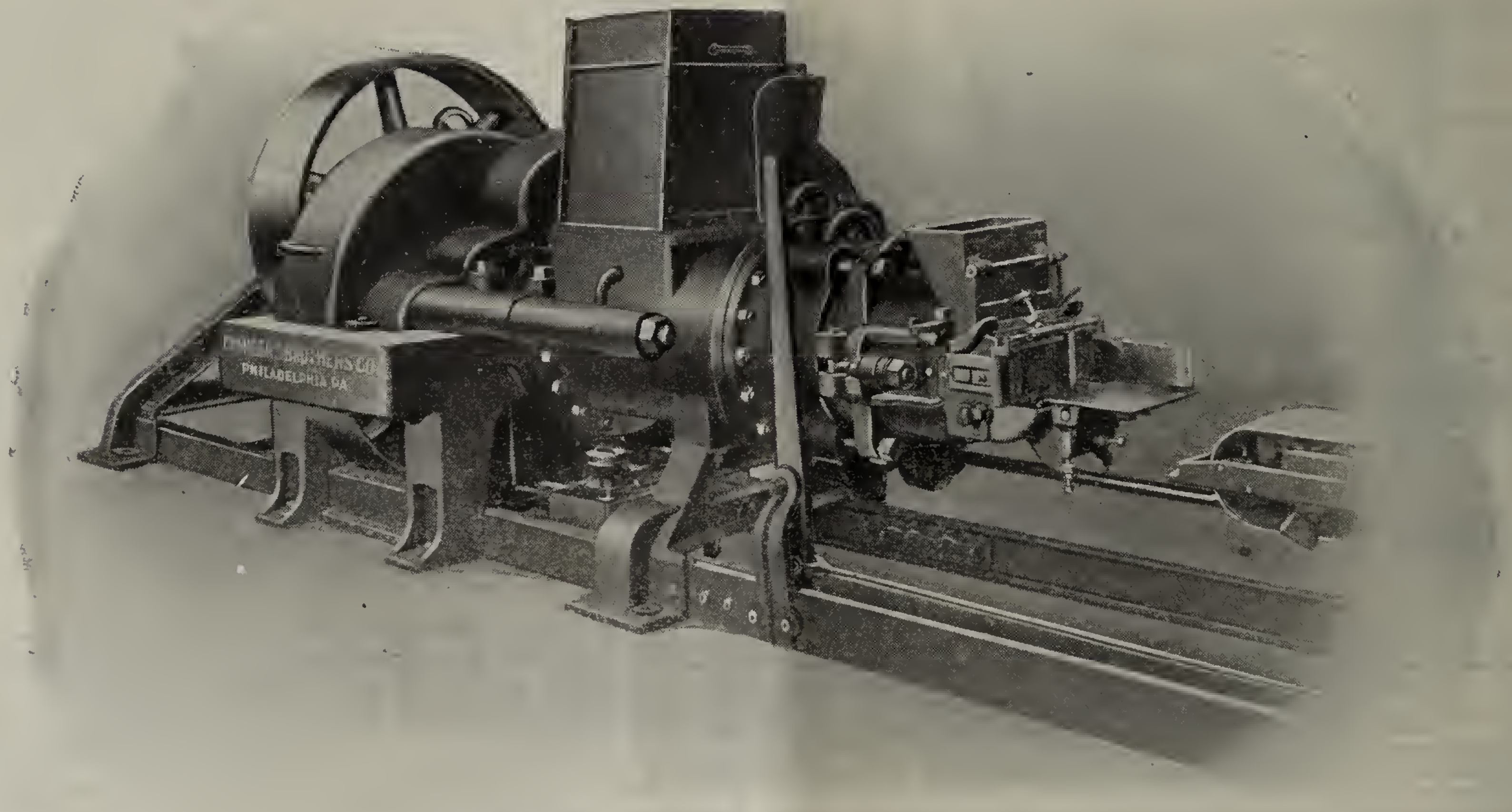

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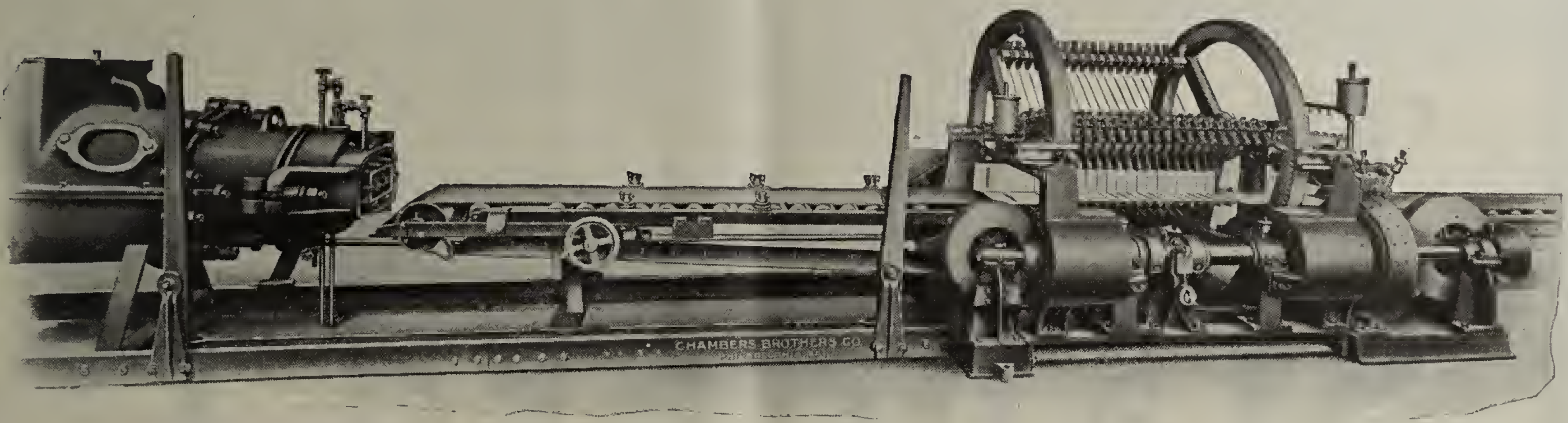

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

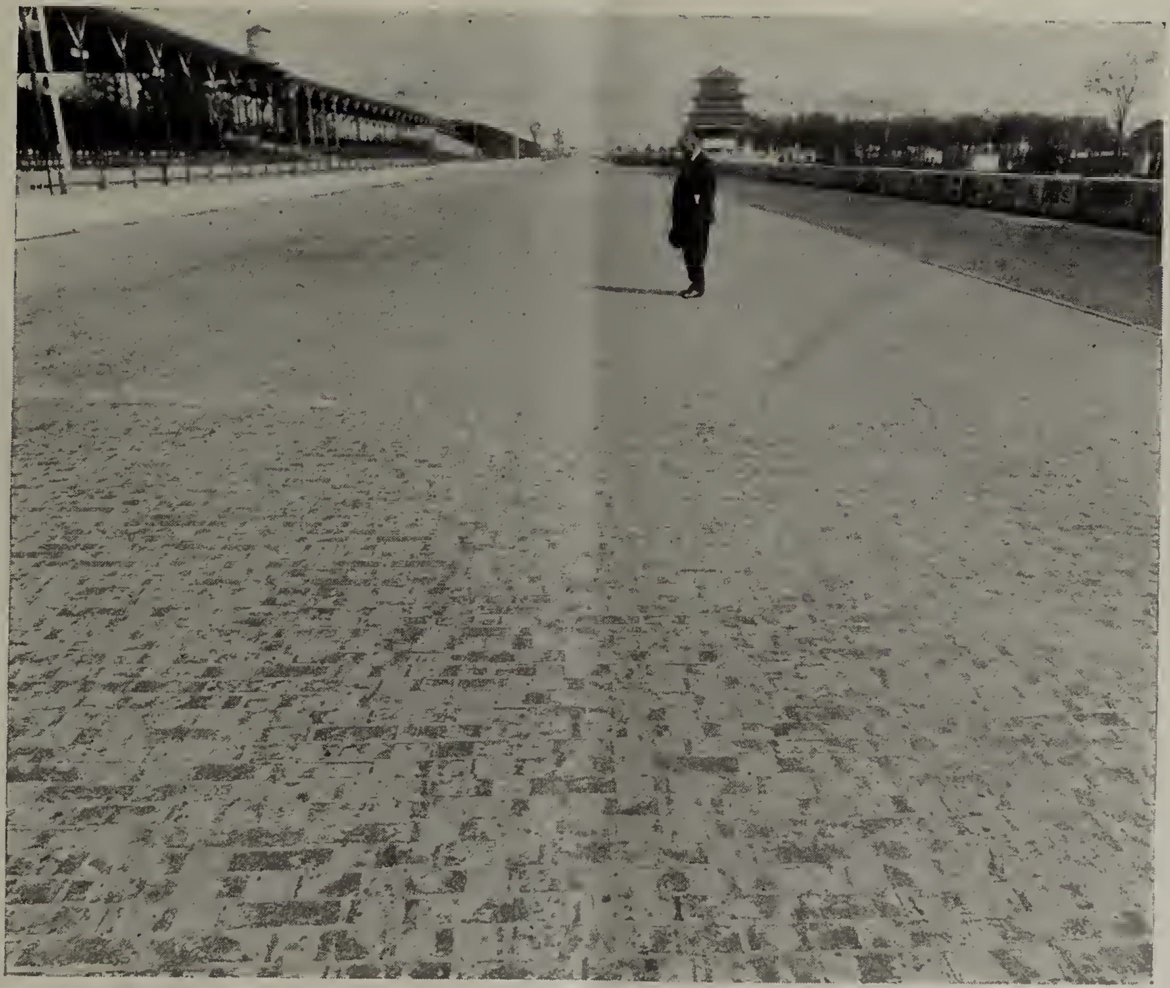
Vol. LXV. INDIANAPOLIS, IND., MAY, 1916. No. 5

Written for The Clay-Worker.

THE WORLD FAMOUS BRICK PAVED SPEEDWAY

The Greatest Auto Race of the Year, May 30th, When the Speed Kings Will Strive to Break all Records.

PREPAREDNESS is a safeguard against danger and death, and not a menace to peace and well being, as some pacifists would have us believe. An illustrious illustration of this fact is afforded by the world-famous Indianapolis Motor Speedway. This momentous undertaking which astonished the sporting world when it was inaugurated, seven years ago, became at that time the topic of conversation in every athletic club and amusement circle both at home and abroad. This was due in no small degree to the fabulous prizes offered, $50,000 in real money, not stage money, was offered to the winner of the 500 mile race. Many thousand speed-mad motorists gathered at the Hoosier capital to witness this tremenduous test of endurance, courage and daring. The first year the track was an excellent macadam roadway costing several hundred thousand dollars, yet the terrific speed of the racers tore it to pieces. Before the race was half over, a frightful accident occurred, resulting in the death of one of the well known drivers and his mechanician and the serious injury of several others.



Home Stretch on Motor Speedway. Note Perfect Condition of Brick Pavement After Seven Year's Use.

Sensing the danger of further accidents and desiring to avoid them if possible, the promoters and owners of the Speedway, a group of Indianapolis sportsmen, Carl G. Fisher, James A. Allison, F. H. Wheeler and A. C. Newby, conceived the idea of a permanent indestructible track, a brick-paved course that would make motoring at the rate of a mile a minute a pleasant pastime, and make racing at even higher speeds comparatively safe to contestants and a delight to all beholders, so the great oblong track two and one-half miles long, and sixty feet in width, was surfaced with paving brick. Now after seven years of use, the pavement is practically as good as when first laid, and the world's record for various distances ranging from a single mile to fifty, one hundred and several hundred miles, has been made on this track. For several years past the chief event has been the five hundred mile race. This year it is reduced to three hundred miles, which it is thought will prove of greater interest, and conduce to the pleasure of visitors.

The acreage covered by the Speedway is 328, with practically a flush mile of stands seating 75,000 people, and forty other buildings, including garages, eating pavillions, lodge houses, cottages for racing teams, office buildings, machine shops and aviation sheds. Parking space is provided for ten thousand machines. In round numbers a quarter million spectators is the course's total capacity. Three and one-half million paving brick were used in its construction. The gate receipts are said to be the largest in the sporting history of the world. While the chief event this year is a 300 mile race, plans are being made for a thousand mile race for $100,000, with only winners of former 500 mile races eligible.

Program for the Coming Races.

Inconveniences to visitors to Indianapolis for the Memorial day automobile race this year will be eliminated automatically by the change in the hour of starting, according to Pete Willis, representing the officials. Willis declares that starting the race at 1:30 p. m. instead of early in the morning, will accomplish this better than any other means which can be found.

The change in the starting time for the Sixth Annual International sweepstakes from early morning to 1:30 in the afternoon will eliminate a great deal of the inconveniences to spectators, especially transients. Heretofore it has been necessary for every one either to be in Indianapolis the night before the race or to travel all night in trains or motor cars. However, the revised starting time permits thousands, especially in Indiana and adjoining states, to remain in their homes the night before the race and still get to Indianapolis for the start of the race.

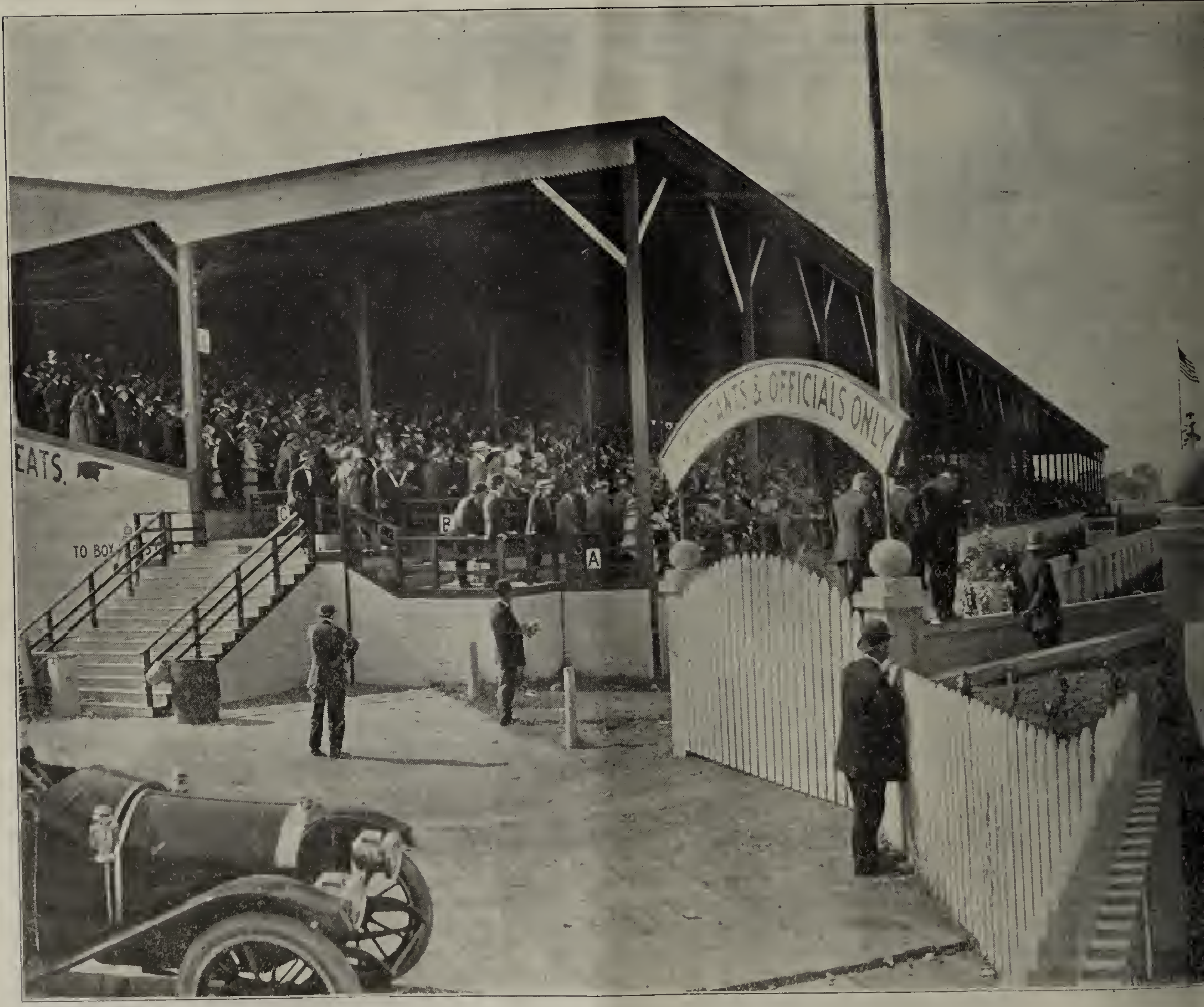
This, it is thought, will relieve the congestion of the down-town hotels and eliminate much of the inconvenience contingent with such gatherings. Even as far away as Chicago, spectators can leave their homes early Tuesday morning and motor to Indianapolis in time for the race. Owing to the interurban system of Indiana, all lines coming to a terminus at Indianapolis, most of the small towns over the entire state are tapped by these electric systems, which will bring people there in the morning and take them home at night after the race, thus eliminating the hotel congestion also on the night of May 30. The distance of the race this year has been cut from 500 to 300 miles.

The primary object in cutting this distance was to shorten the length of the race so as to give spectators a more spectacular and thrilling race, while it lasted, without dragging it out into a tiresome performance. However, a by-product of this shortening of the distance undoubtedly will mean fiercer competition and a much faster mile per hour time.

Dickson to be Starter.

The driver can go faster right from the start of the race this year, because there are 200 miles' wear on his car for which he doesn't have to conserve. It is said that the greatest list of entries ever brought together are scheduled to start at Indianapolis in this event.

George M. Dickson, general manager of the National Mo-



North Grand Stand and Judge's Pavilions at the Indianapolis Motor Speedway. Showing the Racers Lined Up tor Vehicle Co., is to be the starter, and Howard Marmon, of the Nordyke & Marmon Co., referee. Frank E. Smith, vice-president of the Premier Corporation, is pacemaker.

The first international race at Indianapolis in 1911 was won by Ray Harroun in a Marmon, 74.59 miles an hour; Joe Dawson, in a National, won in 1912, average 78.70; Jules Goux, from Paris, with a Peugeot car, won in 1913, average 75.92, falling short of Dawson's speed; Rene Thomas, from Europe, in a foreign built Delage car, won in 1914, average 82.47. Last year DePalma and Dario Resta fought it out, with DePalma emerging victorious, averaging 89.84.

Starters in Indianapolis May 30th Race.

The official list of starters in the 300-mile International Sweepstakes classic to be held on the Indianapolis Motor Speedway, May 30, has been announced by the officials of the Speedway through T. E. Myers, general manager. Thirty entries are listed and they comprise the cream of racing cars of the speed world. The official list of cars and drivers, the bore and stroke follow:

No.	Car.	Driver.	
1.	Delage	Oldfield	3.725x6.300
2.	Peugeot	Aitken	3.600x6.700
3.	Peugeot	Merz	3.600x6.700
4.	Peugeot	Mulford	3.600x6.700
5.	Delage	Limberg	3.725x6.300
6.	Delage	LeCain	3.725x6.300
7.	Delage	Not named	3,725x6.300
8.	DuChesneau Special	DuChesneau	3.750x5.500
9.	Crawford	Chandler	3.750x6.750
10.	Crawford	Lewis	3,750x6.750
11.	Crawford	Johnson	3.750x6.750
12.	Duesenberg	O'Donnell	3.750x6.750
13.	Duesenberg	D'Alene	3.750x6.750
14.	Duesenberg	Milton	3.750x6.750
15.	Sunbeam	Christiaens	81mmx150mm
16.	Sunbeam	Franchi	81mmx150mm
17.	Frontenac	L. Chevrolet	3.870x6.375
18.	Frontenac	A. Chevrolet	3.870x6.375
19.	Frontenac	G. Chevrolet	3,870x6.375
20.	Maxwell	Rickenbacher	3.750x6.750
21.	Maxwell	Henderson	3.750x6.750
22.	Premier	Anderson	3.600x6.700
23.	Premier	Rooney	3.600x6.700
24.	Premier	Stillman	3.600x6.700
25.	Erwin Special	Bergdoll	4.000x5 15/16
26.	Erwin Special	Stecher	4.000x5 15/16
27.	Peugeot	Resta	92mmx169mm
28.	Osteweg Special	Ostewek	4 11/32x5
29.	Mystery Car	Not named	3.750x8 15/16
30.	Ogren Special	Alley	3 63/64x6

The race starts at 1:30.

Ready to Start the Five-hundred-mile Race. The Marks on the Brick Pavement are Oil Stains from the Speeding Autos.

BRICK SELLING SERVICE

THE SCIENCE of brick selling is having some new chapters added to it, and one of the important chapters has to do with service. Service is a great by-word of the day, and in some instances it is worked to death; but very few of these instances are found in the brick selling business. Service is a great word in brick selling right now, and a little careful study of it should enable the average brick manufacturer to materially increase his trade, especially with the home builder.

There is service and service. There is the big undertaking, where the quantity of brick required is such that prompt service can be given only by some large manufacturer or some one with an enormous stock of brick on hand. This class of service is pretty well understood and has been a factor in the trade for many years, especially in selling to architects who have large building projects on hand.

The service that is proving the winner today, however, has to do with another branch of the business, with rendering service to the individual home builder in order to sell him brick. This service is largely one of estimating and of laying before the prospective home builder figures of comparative cost between brick and frame construction and figures that the brick manufacturers can stand behind with a guarantee.

This order of service really means the establishing of a complete estimating department. The lumber dealer and the planing mill man always expect to maintain an estimating department, and in the brick boosting of today this has proven to be one of the essentials to successful selling. It is not enough to give the prospective home builder some general figures on comparative cost, but figures taken from actual work that has been done heretofore. These help, especially in getting the prospective builder interested in brick. But the kind of service he really wants is that which will tell him just what it will cost to put up the building he has in mind and use brick.

This means that instead of the brick manufacturer setting forth certain prices per thousand on his brick and estimating that it will take so many brick to build a square of wall of given thickness or so many to do the job, the brick manufacturer must go further into the matter. He must, so far as all practical purposes are concerned, become a contractor in his figuring. The right idea in service of this kind is to take the house owner's plans and, if required, figure out for him the exact cost of the completed house, including brick walls and whatever interior finish he may desire. This is being done by lumber men. They realize that it is not enough to make a prospective builder an estimate on the quantity of lumber required to put up a given building, but in order to give the right kind of service they must be in a position to tell him what the completed house will cost. In some instances the lumber people have actually gone into the contracting business so as to make this feature a positive one in the business. Others, however, find that by có-operating with the building contractors they are able to figure with a fair degree of positiveness upon the cost of work and of other material that enters, so the enterprising retail lumber man of today is in a position to, and willingly does, give to the prospective builder an estimate of the cost of a complete house, including foundation and either brick walls or frame walls, and he does all this, furnishes this service simply to sell his lumber and whatever other building material he may be carrying.

It is up to brick manufacturers to make use of the same kind of selling service if they would reap the full harvest from the present campaign of boosting brick. That it can be done is demonstrated by the fact that it has been done here and there in the trade. From time to time we have letters from enterprising brick manufacturers who have taken this matter up and have practiced estimating until they are in a position to give the kind of service that tells the right story and sells the product. Where this idea has been followed out thoroughly and persistently by brick manufacturers, it has invariably led to a predominating use of brick in home building. About nine times out of ten, where the brick man knows his business and is in a position to give this kind of service and gets to the prospective builder before the contract is let, he can induce that builder to use brick for his outer walls instead of frame. This has been accomplished in sections of the country where lumber is very cheap, where it does not cost more than half the price paid in a large part of the building territory, and if it can be done in communities with this kind of a handicap, certainly it ought to be an easy proposition in the average town or city or in the territory surrounding the average brick manufacturer.

There are other chapters that have been added to the science of brick selling, an important one being knowledge of brick and its possibilities in architecture. That brick salesmen have been very delinquent in this respect in the past is evidenced by various incidents where architects themselves have gone to the brick plants and have found elements of special beauty and desirability in what the brick manufacturer has considered bad burns, and these discoveries have led to the paying of higher prices for brick that in the eyes of the brick manufacturer were considered off color and of but little value. We have had many jolts of this kind to awaken brick manufacturers and set them thinking about the architectural possibilities of unintentional and unexpected burns that result in a product differing in color from what it was intended and often varying considerably. It is out of a study of these things that we have been developing the face brick business, and it is from learning values in this connection that many brick manufacturers have been able to realize more for their face brick product than they ever dreamed of getting in times gone by.

The most important new idea, however, in connection with selling to the home builder, especially the builder of the bungalow and the modest house, is that of service. It is up to the brick manufacturer to qualify and prepare himself that he may give service that heretofore was not considered as being a part of the brick selling game. It is not a time for arguing that the contractor and the bricklayer should figure out what it will cost to build a house. What their duties are and what they ought to do is not the concern of the brick manufacturer so much as what he himself can do to help boost the brick business. One of the things which has been proven by actual tests as being a winning card is that of having an estimating department and being prepared to give the prospective builder figures on a completed house, not only figures of the cost built with brick, but have a comparison of these figures with the cost of frame construction. The man who has data of this kind compiled and can send forth positive statements to prospective builders and then back them up with positive estimates of cost can, nine times out of ten, make good the slogan, "Build With Brick."

CLAY WORK AT THE WISCONSIN UNIVERSITY.

A recent bulletin of the University of Wisconsin, Madison, says: How to transform clay, copper and silver into useful and well designed articles for the home or for personal use is studied in courses in applied arts in clay and metal given by the Department of Manual Arts at the University of Wisconsin. Upon completing the work, the students are capable of teaching the subjects or entering a small factory.

Each student potter or metal worker, by means of weekly individual conferences, develops original drawings and practical working drawings. These drawings are then taken to the laboratory and worked out in the material. In the clayworkers' class this leads to experiments to test the value of Wisconsin clays, the mixing of glazes, all of which terminate in a final test of a ten-hour firing of the ware.

The materials of the different laboratories are frequently combined. Wood, clay and metal are united in lamps, cooking utensils and architectural furnishings which find a ready reception in the student's room or home.

BUTTON HOLE TALKS

"One Touch of Nature Makes the Whole World Kin."

HE WAS SITTING on a park bench and seemed engrossed in what he was doing, all wrapped up in it and oblivious of all outside. Some way I felt curious as to what he was at so that I worked up near him, but without attracting his attention so as to interfere, while I watched him. Up in the trees over his head the Blue Jays were making an infernal clatter, were getting absolutely profane in their remarks. The Blue Jay has, someway, always been interesting to me; has seemed to have a character of its own, distinctive from all other birds. He's a sassy bird, a noisy bird, an inquisitive bird, and a bird that is often absolutely profane. Really, I think, it is the only bird I know that actually swears, doing it, too, fluently and as accustomed to it and without any appreciable effort. But passing, for the moment, from the Blue Jays, I looked more closely to the man on the bench. He had a pocket full of nuts and was doling them out to the squirrels. A squirrel would come galloping up to him and he would have a lot of fun making him hunt for the nut, then away would go the squirrel hunting craftily for a good place in the turf to hide it; would pick out this place and then that, as being more secure; would dig in a little, then look cunningly around, then trot off and select another place and dig some more, then drop the nut in and wedge it down into its place, firmly, with his nose, cover it carefully, look wisely around again, and then come galloping back for another nut. He was harvesting in harvest time, while the supply was there, and laying up his store for the future. You could see from the wise twist of his head that he was mentally mapping out his ground so that he could find them later on as he wanted them. But the man on the bench delayed him, kept fooling him, while at the same time I could see that he kept watching the place where the wise little squirrel had planted the last nut. So I watched too, my curiosity being fully aroused, and I was rewarded at last and saw the game he was playing. As soon as mister squirrel started off to hide a nut, mister Blue Jay got very quiet and went sneaking along, from limb to limb, with those bright eyes of his doing active duty in keeping every movement of mister squirrel under his active supervision. He was deceived by none of those false digging motions but his keen eyes kept close watch on the nut and never a peep did he let out, for he was now on a still hunt. When there came the final ramming in of the nut and the careful covering of the hole, he gave a wise wink and sat close. As soon as mister squirrel was back, actively engaged in getting another nut, mister Blue Jay lit down, without saying a word in the quietest manner possible, and tore the nut from its hiding place. He bore it up in the tree top, stuck it into a crevice in the bark of the tree and then yelled and laughed till the woods rang with his merriment. He certainly had a keen sense of the ridiculous and as he thought of the time when the squirrel would come looking for his store of nuts he would laugh until his wings dropped and would nearly fall off the limb. Then, recovering himself, he would flit back near the man and yell at him and call him names so as to distract attention, but ready all the time and alert to mark down the next nut planted. The man on the bench was taking it all in, was thoroughly enjoying it all, laughing and chuckling as he doled out nut after nut.

The Blue Jay was surely enjoying himself to the limit. Suddenly his attention was distracted elsewhere and he lit out for the point at which he had stored his accumulation and let out a yell of fury. Another squirrel had there been busy and had been piping him off and had carried every nut safe into a hole in the tree and hastily fled in there with them. Hovering at the entrance to the hole, but helpless to do anything more, the Jay ramped and swore, was utterly and absolutely profane, as he expressed his feelings.

Just then the man on the bench looked up and caught my eye. Laughingly he nodded, noting my enjoyment of the situation, and remarked:

"We humans haven't it all in our skulls by any manner of means. Animal nature is some study as among us. Some use strength and some scheming to get what they want but they go after it and they get it. That Jay dare not come close and get the nuts. The squirrel has the courage, or assurance, to come get them. Then the Jay uses strategy, gets them and euchers the squirrel. Then the retiring, quiet squirrel over there does the Jay up. How intensely human they all are after all. Doing just what we mortals are doing all the time, taking it away from each other. It's just a little edition of the life in the great big world." GATES.

PACIFIC NORTHWEST CLAY NOTES.

THE CLAYWORKING situation in the Pacific Northwest is improved. The general building prospects are good, and while the demand for all kinds of clay products is not very brisk just now, there are prospects that it will greatly increase during the summer months. According to the building permits issued last month Spokane showed the healthiest condition. The permits increased 140 per cent over last year in a single month. The other cities they were about constant

	March, 1915	March, 1916
Total Building Permits, Seattle	$689,675	$735,785
Portland	503,755	420,560
Spokane	102,660	246,059
Tacoma	192,450	168,122

The Denny-Renton Clay & Coal Co. of Seattle, has secured a large contract for paving brick which will be used on Ranier Boulevard, which connects Seattle and Renton.

The Far West Clay Co., of Tacoma, are now manufacturing a first class grade of fire brick and secured an order for 100,000 for these brick from the American Smelting & Refining Co. to be used in their smelter at Point Defiance, Washington.

The Oregon Clayworkers Association, through their committee headed by Mr. Harold Smith, their president, secured the pledge of the Board of Control that prison made brick would be used on State Buildings only, and that the specifications for the work, would mention this fact.

The Dyer Construction Co., of Cleveland, Ohio, who has the contract for the Grants Pass Beet Sugar Factory, are making their own brick at Grants Pass, about three-quarters of a million are needed for that work.

The Fairmount Brick & Tile Co., of Eugene, are now furnishing all the face brick for the new grade school and also for the new University Building in Eugene. Mr. W. A. Field, reports business steady increasing and good demand for their face and common brick. SIWASH.

It is a commonly accepted truism that wealth constitutes a burden of responsibility, but there are lots of us willing to risk breaking our backs with a heavy share of it.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

IT IS A LONG TIME SINCE the San Francisco clay products concerns have been in as optimistic a mood as they are at present. Prosperity, long predicted, appears to be arriving in a truly substantial manner, yet without any freak or boom tendencies. Were it not a fact that the prices of necessities are continually rising, the general feeling would be still more healthy. The high cost of living seems to offset the good effect of better business. Most local building material firms report very satisfactory April business and without exception the dealers look for a big volume for May. Prices of Coast clay products have not been materially advanced in any line, but it is not so certain that there will not be advances. The Coast labor situation is apparently quite steady, with no special prospect of strikes in the near future, and there is more demand for labor of all classes than last year or the year before. The logging camps are operating on a fully normal scale and the lumber market is encouragingly active, with some rather stiff advances in prices due mostly to increased shipping rates by water. The brick market looks better just now than for a long time. The high prices of structural steel and steel for concrete re-inforcing, is stimulating the brick demand, and the Eastern method of combining the use of brick and concrete is being introduced on the Coast with fine results, which is another reason for the clay products people to rejoice. The most notable fact to be mentioned, however, is the spirit of confidence which has become vastly strengthened in all commercial circles of late. The business people now feel that the danger of this country being mixed up in the European struggle, or with any really vital difficulty in Mexico, is past and that it is comparatively safe to go ahead with project planned several years ago. Thus the building activity in industrial departments all over the Coast country is quite genuine. The building operations are not confined to any one district, but well distributed, and the way things are going proves that there is not only plenty of capital available for productive enterprises in the manufacturing field, but also for many important civic, educational and philanthropic buildings. On the east side of San Francisco bay a number of large warehouses, largely owned by Eastern companies, are being erected and in this heavy type of construction work the percentage of brick used is large. Chemical works, soap factories, automobile plants, woolen mills and other large buildings being put up in this vicinity all call for heavy brick deliveries.

The fire brick demand is stronger than ever by reason of the increased amount of industrial building, and because of the number of plants being rebuilt or enlarged. The export demand for brick of all kinds is looking up also, notably the Hawaiian demand. Face brick is moving well, and the demand is comparatively as lively as the common brick demand.

The terra cotta plants are all operating on a large scale, the market for terra cotta products having picked up most encouragingly. New terra cotta novelties are being pushed with considerable success by several local concerns, and there is a hopeful tendency to create new markets, promote new uses and develope the possibilities of terra cotta to the full. Prices on terra cotta are said to be a little more satisfactory on the average.

The Steiger Terra Cotta & Pottery Co. is putting out a splendid new terra cotta building material which they call the "Thru-an-Thru" terra cotta. This product is made to resemble the marble as nature made it, the coloring being mixed through and through in the material so that if a chip breaks off there is no unsightly scar to spoil the effect. The general appearance of the new product is like that of the imitation Travertine marble used at the Exposition last year, only it is imperishable. One of the special advantages of this material is that it can be cut and worked over and give beautiful face effects in cross section. The Steiger company has a display of two beautiful classic columns made of the product in a show window on the Bush St. side of the Mills Building, San Francisco. Architects here are enthusiastic over the material and the company has already received numerous inquiries from members of the building trades specially interested in the highest class building materials.

Among the recent contracts closed by the Steiger company are: terra cotta materials for the northeast and southeast wings of the San Francisco City and County Hospital, terra cotta to the value of about $30,000, principally of the matt ivory glaze, but also polychrome types; a contract for matt glaze terra cotta for the new Hall of Justice at Sacramento, a $12,000 job; and other new jobs of less importance. The company is already delivering terra cotta, or about to begin, for the Redding Grammar School, at Redding, Cal.; the Lange and Bergstrom Apartments, Post and Leavensworth streets, San Francisco; a department store at Logan, Utah, and the Fortuna and Delucchi building at Stockton, Cal.

Athol McBean, of the Gladding, McBean company states that the terra cotta outlook is more encouraging than it has been for some time. The company has closed a large contract for terra cotta for the new J. K. Armsby building at California and Davis St., San Francisco; a terra cotta contract for the new high school at El Centro, Cal., and contracts also for terra cotta on the following: The Overland Garage on Van Ness Ave., San Francisco; the Woman's Athletic Club, San Francisco; the Kerkhoff Building, Los Angeles; the Roman Catholic Church at Bisbee, Ariz., the addition to the Pacific Mutual Life building at Los Angeles, and the Portland Auditorium at Portland, Ore. The company is also furnishing 350,000 grey face brick for the new public library of San Francisco, and a large amount of vitrified sewer pipe for the city of Stockton.

Gladding, McBean & Co. are dismantling the plant of the Carnegie Brick & Terra Cotta Co. at Corral Hollow in San Joaquin County, which plant was recently purchased by them. The Carnegie plant will not be used in any way for manufacturing clay products.

C. F. Pratt, president and manager of the Pratt Building Materials Co., says he is having very encouraging success with the Hercules Terra Cotta Interlocking Tile which he is introducing in this territory. This product is manufactured by a California factory for the Pratt company and is designed for wall construction. The chief points of merit are its safety, durability, economy and structural strength. It is a non-conductor of heat, cold, moisture and sound, and is fireproof.

The McNear Brick Agency delivered 1,700,000 common brick in April and W. W. Dennis says the prospects for May are bright indeed. The company is delivering on such jobs as the Lane Hospital addition, which requires about a million brick, and the new University hospital at the Affiliated Colleges which takes another million or so. They are still delivering on the Civic Center work here and recently shipped half a million brick to Honolulu and to points along the Coast, the shipments to the latter being for the logging industry. Mr. Dennis reports that the Ione Firebrick Co. is the busiest this year it has been for five years.

It is stated that M. Platt of San Pablo, is contemplating the establishment of a pottery plant at Santa Cruz, Cal.

William Anderson, an experienced manufacturer of brick, tile and building blocks, is taking the lead in the project of establishing a brick making plant at Modesto, Cal. A company is to be formed under the name of the Union Brick & Tile Co. Tests of clay are being made and it is hoped to have a plant in operation this summer.

San Francisco, May 5. SUNSET.

With the women folks taking a hand in the political pot boiling we should be able to develop some fine stews this year.

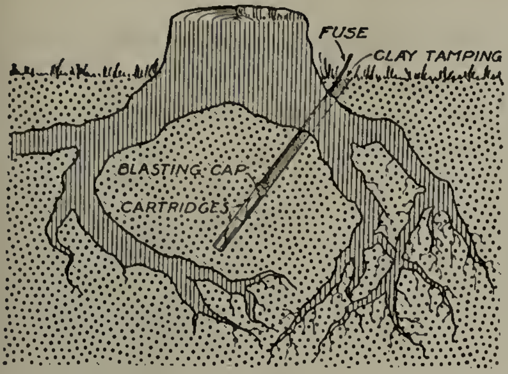


Fig. 2. Correct Method of Loading a Small Stump.

STRIPPING

Detailing Methods of Blasting Out Stumps, Snags and Boulders and the Correct Use of Explosives in Removing the Overburden.

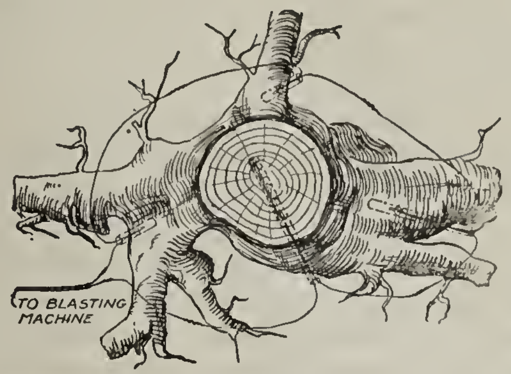


Fig. 3. Correct Method of Loading a Large Stump for an Electric Blast.

MANY OPEN CLAY PITS where the finer grades are mined are encumbered with more or less over-burden that must be removed before the usable clays are reached. Here the effort should be to cheapen the work as much as possible, as the excavated material is usually wasted. The stripping operations do not differ from the same class of work in other digging, as they vary all the way from the use of a steam shovel and a train of cars, to hand-loaded carts or wheelbarrows.

The number and character of stumps, snags and boulders play an important part in stripping. The method of their removal should be governed by the method of digging that is employed. When a steam shovel or other heavy machine is used, the stumps should be split and the roots shaken free of the soil by light blasts. This hastens the work and reduces the strain on the machine. The method of loading is similar to that advised for blasting out small stumps, but the loading is lighter.

When either hand digging or scrapers are used the stump should be blown entirely out and split into fragments by properly placed blasts.

If the stumps are small the best practice is to punch or bore a hole diagonally under the stump, as is shown in figure 2, and load it with a sufficient charge of Red Cross Stumping Powder or Red Cross Extra 40 per cent. Dynamite. Such a blast needs but one charge and may be fired by means of either blasting cap and fuse or electric blasting cap. The advantages of electric firing will be more clearly pointed out in a following paragraph. Care should be exercised to keep the charge well below the base of the stump, in order to make sure of the best results, and to lift out the maximum amount of roots.

Large stumps are harder to blow out and are most economically removed by electric blasts similar to the diagram, figure 3. The center hole is under the main part of the stump as before. Other holes are made under the larger roots. As all of the holes must be fired at the same time, the use of electric blasting caps is imperative.

Tap-rooted stumps can be blasted by either of two methods: A charge can be placed in a hole bored into the tap root; or two charges can be placed, on opposite sides, well down the tap root and fired electrically. This method is to be preferred, as it brings out more of the bottom end of the tap root, which is most desirable in this class of work. Fig-

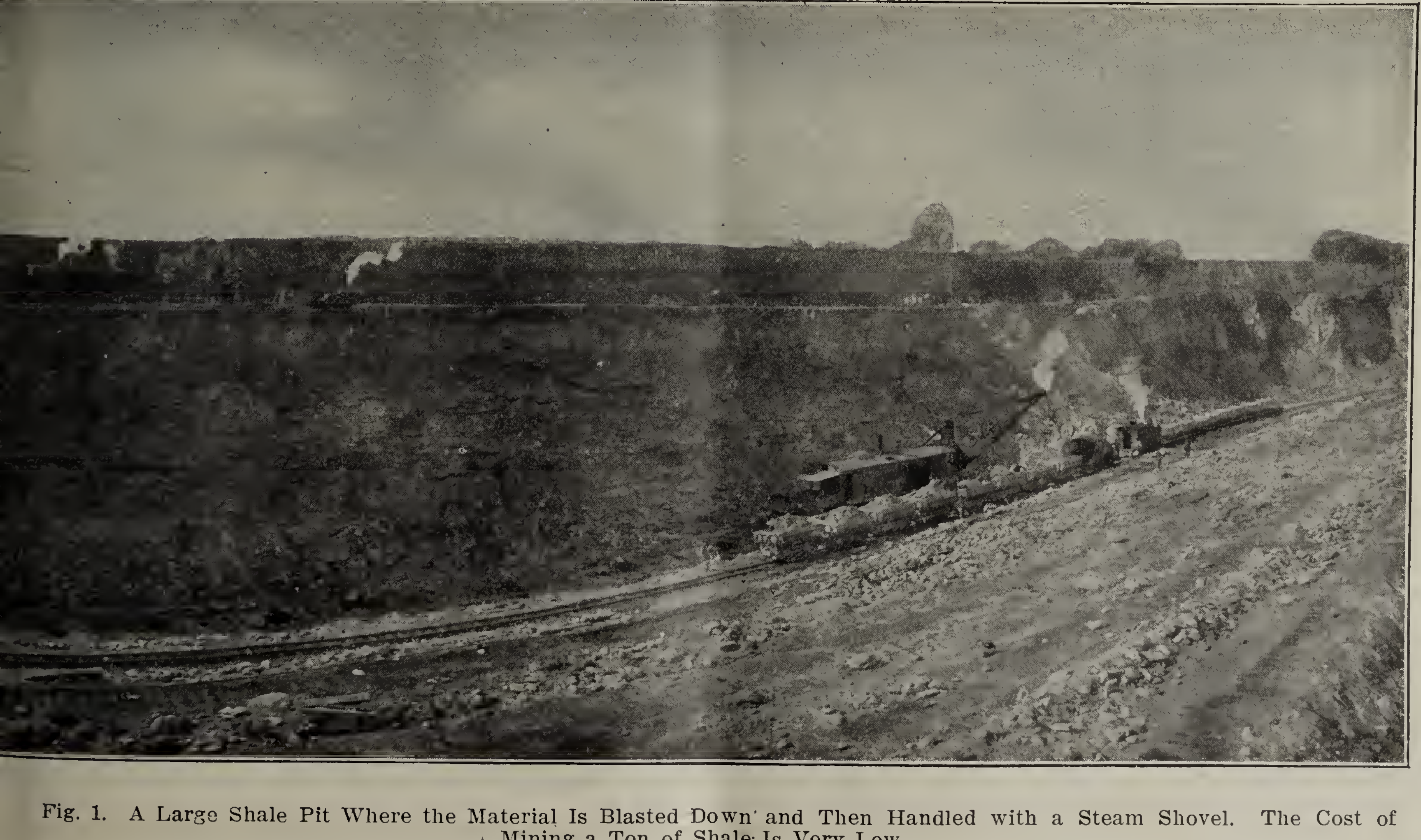


Fig. 1. A Large Shale Pit Where the Material Is Blasted Down and Then Handled with a Steam Shovel. The Cost of Mining a Ton of Shale Is Very Low.

ure 4 shows the method of loading for blasting out such stumps, using two charges. Frequently small tap-rooted stumps can be blasted out by a single charge placed well down on the root.

When boulders are encountered in stripping operations, they can be easily broken by a charge placed in a block hole such as is shown in figure 5. This requires drilling into the boulder, which is not at all times practical. Any grade or strength of dynamite recommended in this article will be satisfactory for the work. The hole should be well tamped. This method is most strongly recommended for handling large "niggerhead" boulders that are difficult to break. It is also best for shattering large lumps of hard or frozen clay.

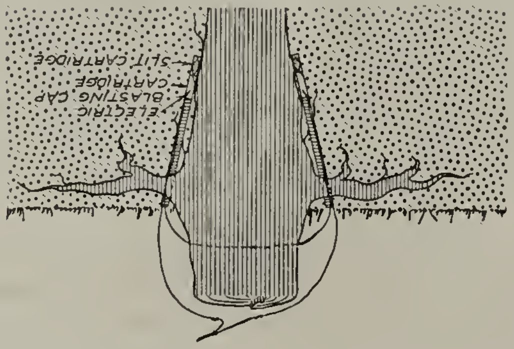


Fig. 4. Loading a Large Tap-rooted. Stump for an Electric Blast.

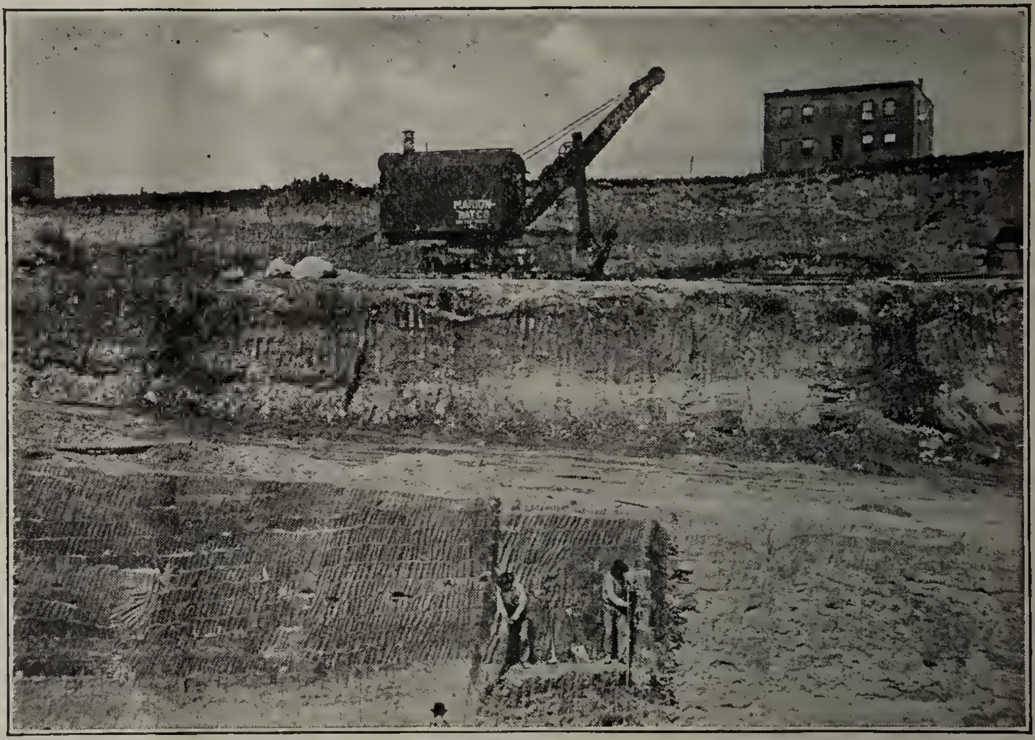


Fig. 8. Steam Shovel Stripping a Clay Pit. Blasting is Practiced When the Ground is Hard or Frozen.

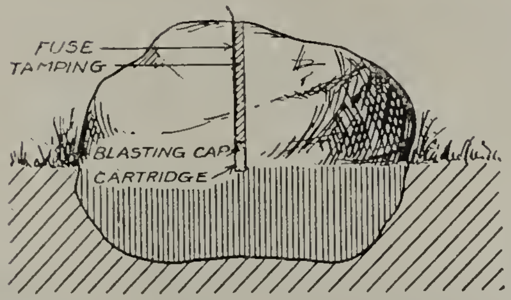


Fig. 5. Properly Placed Block Hole Charge for Shattering a Large Boulder.

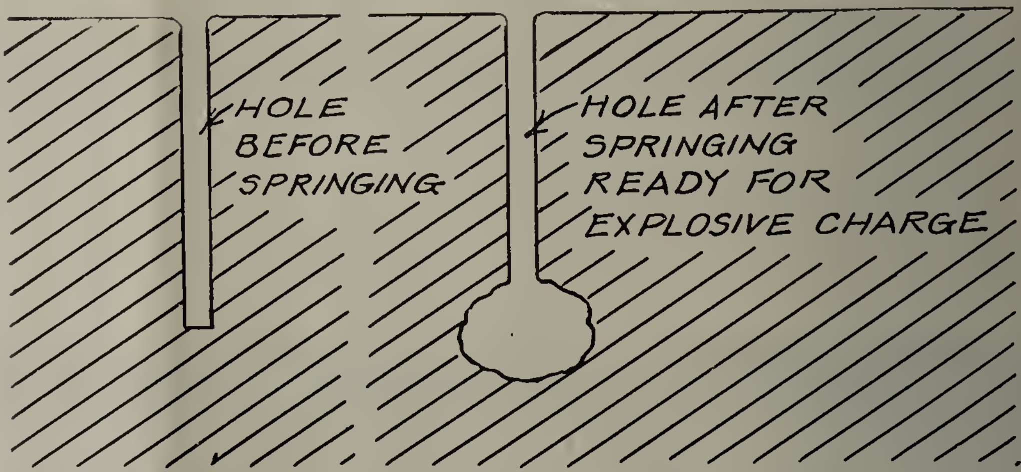


Fig. 9. Springing a Bore Hole. Dynamite Is Fired in the Bottom of the Hole to Enlarge It.

Boulders, when not too large or hard, can be easily broken by mud capping, as is shown in figure 6. This consists of placing a charge of dynamite on a vulnerable place on the boulder and covering it with a heavy layer of mud. Avoid the use of any stones in the mud cap, as they are dangerous. The explosive recommended is 40 per cent. or stronger, Red Cross dynamite, or if there is much of this class of work to do, Du Pont Straight 50 per cent. dynamite.

Boulders can be broken or blown out of the way by snake hole blasts such as is shown in figure 7. Heavy loading by this method will completely shatter the boulder. Lighter loading will roll the boulder out. When it is desirable to throw a boulder out of the way or back into worked out portions of the pit, the blast should be placed somewhat under the boulder and on the side away from the pit. When the boulder must be blown some distance heavy loading is required.

The chief use of explosives in stripping is to loosen hard ground, whether hand or mechanical digging is practiced. This hard ground may be hardpan, tight clay, worthless shale, or frozen ground of any kind.

The method of loading will depend on the depth of the cut and on the material encountered. In blasting ahead of a steam shovel the object is to so loosen the material that the dipper can be filled to its full capacity each time, and to reduce the strain on all working parts. The great variety of conditions encountered in this work prevents positive recommendations. As a rule the bore holes are put down about to grade, or a little deeper if there is no danger of injuring valuable clay below. These are spaced back from the face of the cut a distance about equal to the depth of the cut in work from six to eight feet deep. For deeper cuts the distance back from the face and the spacing between the holes can be increased.

The explosives used should be governed by the nature of the ground. Usually Red Cross Extra dynamite of from 20 per cent. to 30 per cent. strength will prove most satisfactory in clay ground and shale, especially in shallow work. Blasting powder is also extensively used in dry ground. The holes must usually be sprung or enlarged by dynamite shots in order to get a sufficiently large hole to load the blasting powder. This is done by firing small charges of dynamite, without tamping, in the bottom of the hole as is shown in figure 9.

It is absolutely necessary, in order to avoid accident, that ample time be given the bore hole to cool off after springing, before charging it with blasting powder or any other explosive. Many serious injuries have been caused by lack of attention to this rule. Just how much time should be allowed is governed by the quantity and the kind of dynamite used for springing, the number and frequency of the springing charges, and the character and condition of the rock, but under no circumstances should an attempt be made to load a bore hole sooner than a couple of hours after the explosion of the last springing charge, and it is better to wait four or five hours. The possibility of a springing charge heating the rock enough to explode the detonator in a subsequent spring charge must also be taken into account, and the blaster should always stand as far back from the mouth of the bore hole as possible when dropping into it any of the springing charges after the first one.

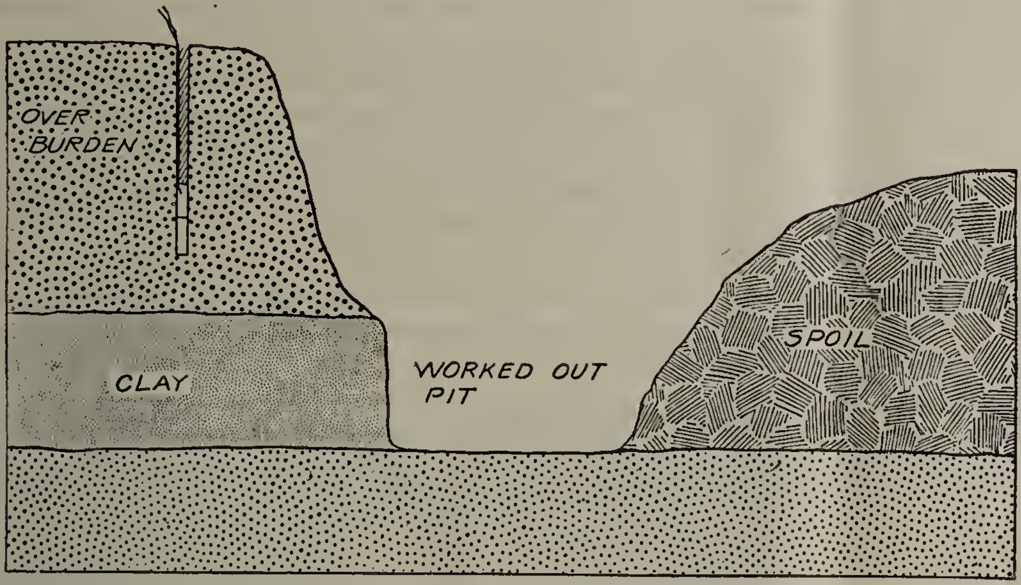


Fig. 10. Method of Loading to Throw the Overburden into Worked-Out Clay Pit.

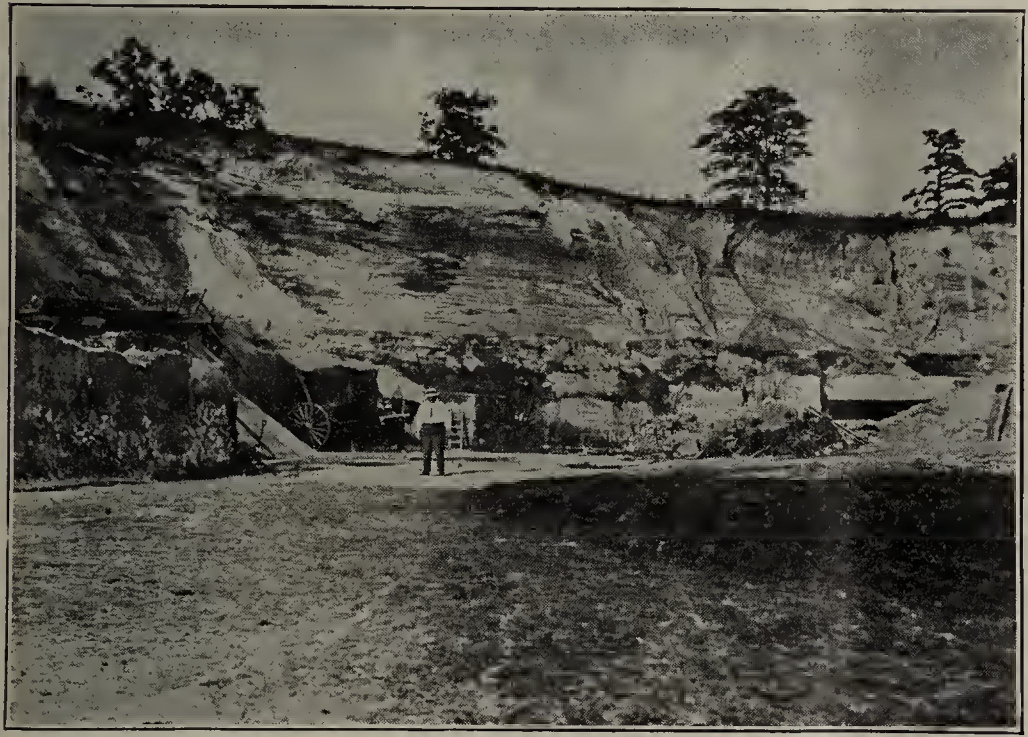


Fig. 11. Chutes or Platforms Can Be Used to Stop or Divert the Clay or Overburden so That It is More Easily Loaded into Wagons.

For very deep and dry work the use of Du Pont Low Powder, RRP, F, or FF, or of Blasting Powder, is found best.

The ground need not be thrown down in all cases as the blasts will so crack and honey-comb it that the shovel will have no trouble. In cold weather the blasting should not be done far ahead of the shoveling on account of the danger of further freezing. When ground that is normally soft is frozen the blasting should be only as deep as the frost. When the ground is plastic better results can be expected if the blasting is done when the ground is dry.

When the hard ground is a simple layer of hardpan with softer ground above or below, the blasts should be placed in, but not above or below, the hardpan.

Blasting to facilitate hand digging or the use of scrapers should be more thorough, as it is often advisable to blow all the material down. This calls for closer spacing of holes or for heavier loading. The explosives recommended and the methods of loading or about the same as has just been described.

When there is room for but a single shot, the use of blasting cap and fuse primers is satisfactory, but when a long bench or face can be worked, better results are obtained by loading a number of holes and firing them all in a single electric blast, as each charge helps the others.

Frequently the stripping is not done far in advance of the clay digging as the waste material is thrown into the worked out pits. When this is the case the heavy overburden can be blasted so as to start a slide as is indicated in figure 10.

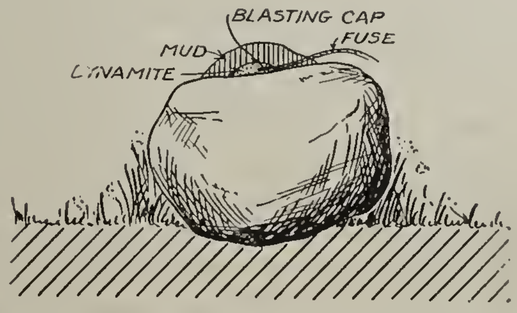


Fig. 6. Correctly Placed Mud Cap. The Mud Cover Should Be Several Inches Thick.

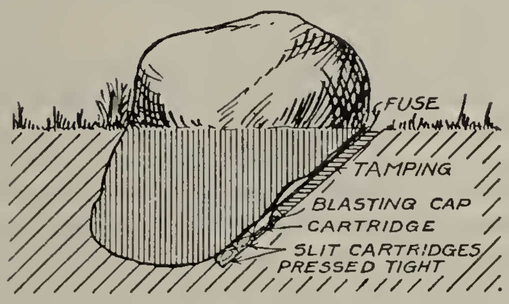


Fig. 7. Proper Method of Placing and Loading a Boulder for Breaking or Moving It with a Snakehole Shot.

When it becomes necessary to remove the stripping by hauling it along the floor of the pit, it can often be blasted as is advised in the preceding paragraph. The use of movable chutes into which the material can be thrown by the blasts, such as is shown in figure 11, is often advisable. When use is made of such chutes, the carts, wagons, or cars can be loaded without rehandling the material. These chutes are recommended when the overburden is commercial sand or other material of which some use can be made. When the material goes to the spoil pile, scrapers are usually more economical and the chute is not needed.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

WITH THE OPENING of the paving season in Milwaukee and other Wisconsin cities, the brick industry in this state has been giving the usual attention to that phase of the business. There is a noticeable increase in the use of brick for paving purposes and cities that have tried out this type of pavement invariably allow a large part of the paving appropriation for brick. Among the cities which have already commenced this work is Appleton, Wis., where a contract has been awarded to Garvey & Weyenberg Co., of that city, for paving Maple Grove avenue with brick. At Washburn, Wis., a contract has been awarded for paving First avenue with brick. Another city in Wisconsin which has always favored brick, and where this style of pavement has proven very successful, is Racine. Four of the prominent streets are to be paved with brick, the contracts having just been awarded. On several paving jobs in Milwaukee, Veedersburg brick will be used, J. F. Kies & Son, M. & M. Bank building, having secured contracts to furnish the brick for several contractors who landed brick paving contracts in this city. An agitation was recently started in Milwaukee by real estate men to have the city use more concrete pavement and combination curb and gutter instead of brick and sandstone. Of course, the reason for this move was to get cheaper paving, no matter how long it will stand up, as real estate men do not hold on to property very long after making improvements. Commissioner of Public Works Fred G. Simmons, who is responsible for the alleged "extravagances," replied with the statement that brick and sandstone gutter will last for twenty years, where a concrete curb and gutter, which costs about 60 per cent. as much as brick and sandstone, will not last for more than six years. Pavement which will last for a much longer period, even if the cost is greater, is the better proposition. If the majority of property holders on a street to be paved prefer concrete to save money at present, Mr. Simmons declared that his department would consent to such construction.

A promising beginning has been made by Wisconsin good road enthusiasts to provide for an organization which will help to systematize the building of good roads in the state. These men have formed the Good Roads Association of Wisconsin and expect to enroll 25,000 members from among the people of the state. State Highway Commissioner John A. Hazlewood and A. R. Hirst, state highway engineer, of Madison, Wis., were present at the meeting held in Milwaukee and these men are co-operating with the association. Wisconsin has spent $15,000,000 on good roads during the past five years and has more than 6,000 miles of permanent highways. This is really only the beginning of the movement and men connected with the paving brick industry have taken keen interest in the matter, so that this type of pavement will, no doubt, be represented.

Another indication of the activities in the brick industry, that which affects the building brick line, is the remarkable increase in construction work authorized this year as against a year ago. The report of Building Inspector W. D. Harper for the month of April shows 534 permits issued, representing improvements in amount of $1,129,962. For 1916, to May 1, the record shows 1,056 permits issued for structures valued at $4,753,548, which represents a 100 per cent. increase over the first four months of 1915.

Work is progressing on the new plant of the Whitewater Brick & Tile Company, of Whitewater, Wis., and it is hoped to have things shaped so that operations can be started by July 1. Residents of that city have taken a great interest in the new industry and a stock issue of 50,000 was disposed of within a comparatively short time. Now that sufficient capital is available, the work is being rushed and success is assured.

The Jefferson Brick & Tile Co., at Jefferson, Wis., was somewhat handicapped early this season in getting started, due to the shortage of labor. The unusual amount of business booked so far this season indicates that a prosperous year can be looked forward to.

The high water this spring and the fact that the dam went out at Burlington, caused a delay of a month to the Burlington Brick & Tile Company in getting started. The company anticipates a brisk demand for drainage tile this season, due to the same cause that delayed their operations.

Plans for developing the industrial possibilities of the clay resources of Menomonie, which are conceded to be among the finest in Wisconsin, are contemplated by business men of that city. G. A. Perry, of Stillwater, Minn., has made tests with building tile made from Menomonie clay, which showed resistance of over 1,000 pounds per square inch. Menomonie-made red brick is well known in these parts and it is now proposed to utilize the clay beds in the manufacture of hollow tile. The clay is suitable for both drainage tile and building tile. E. O. Wright, president of the Commercial Club, has appointed a committee to investigate the possibilities of the industry. Heavy deposits of fine quality clay are found in Menomonie.

The Hydraulic Press Brick Company, of Menomonie, has started rebuilding sheds that were recently burned. Yards Nos. 2 and 4 have been started and are working about one hundred men. Judging from the amount of business on hand, the company will be adding more men shortly and run to capacity. One of its recent contracts was for the brick to be used in the new Lake Street M. E. Church to be erected at Eau Claire, Wis.

M. Nisen & Sons, of Union Grove, are being kept busy by the large demand created through the increased amount of building operations in their vicinity. In addition to brick and tile, these people have produced a building tile which has given excellent satisfaction and resulted in a material increase in their business.

The Estabrooks-Downs Company has been formed at Washburn, by F. W. Downs and C. E. Estabrook. The firm will handle tile and similar products.

One of the biggest brick contracts now before dealers is the requirement for the new $600,000 Milwaukee Athletic Club. The general contract is in the hands of the Foster Construction Company, Milwaukee, which is taking estimates on the following material: 580,000 common brick, 480,000 hollow brick, 173,000 feet of 4-inch partition tile, clay or plaster block, and 145,000 feet 10-inch floor tile.

The Excelsior Brick Co., Menomonie, Wis., started its season's run on April 29 and is employing more than sixty operatives, the largest force in several years. This is necessary because of the large contracts now on the books. The Wisconsin Red Pressed Brick Co., also located at Menomonie, is running full blast with a force in excess of forty men and from twenty to twenty-five will be added as the product advances through the various departments. The company cleaned out the last of its 1915 stock more than ninety days ago. New shipments will begin late in May and practically all the brick that the company can turn out this season are already spoken for. The Tramway Brick Co., another of Menomonie's ceramic institutions, started work May 1 with thirty men. A fine run of orders has been booked and more are coming.

A. BADGER.

SINGLE BUILDING INSPECTION IN NEW YORK.

A bill providing for single inspection of buildings in New York has passed both houses of the legislature. It is intended to end the overlapping and confusion which has attended inspections heretofore, and have greatly increased expenses for sellers of lots and contractors of buildings. The new law creates a board of standards, composed of the five commissioners, five superintendents of buildings, the fire chief and six other members to be appointed by the mayor, to include an architect, a structural engineer and a builder, each to have at least ten years' experience, and one architect or structural engineer of at least fifteen years' experience. A board of appeals is created, composed of the fire chief and the six appointive members, to whom is given the right to review the decision of the board of standards. To the fire commissioner is given power to issue orders in conformity with the building codes, labor law and the rules of the board of standards, and to enforce all laws and ordinances dealing with the use and occupancy of all buildings excepting tenement houses.

MAKING YOUR OWN POTTERY.

Few races of people on earth can boast more household industries than our own wards, the Filipinos. They not only make a great many of the things they require for their own use, but they likewise make many commodities for sale through street vending or in the stores.

Filipino women are very clever in making all sorts of home-made pottery. The peasant class is too poor as a rule to spend hard-earned money for such ware, and for this reason many families make their own.

The women folk have a low, bed-like stool on which to sit on the shady side of the house, and here they ply their art of shaping all kinds of vessels out of wet clay.

Filipino Women Making Pottery.

ANOTHER FIRM JOINS DUNN LICENSEES.

The Standard Brick Company, of Crawfordsville, Ind., has taken out a license from the Dunn Wire-Cut Lug Brick Company for the manufacture of wire-cut lug paving brick. This makes 30 companies operating 48 plants now engaged in the manufacture of wire-cut lug brick. The Standard Brick Company is an established concern with a daily capacity of 25,000 brick, but it is enlarging its plant to a capacity of 35,000 brick daily with the necessary additional kilns to handle the output. The plant now has seven kilns of 70,000 capacity each.

NEW TEXAS COMPANY ŞTARTS CONSTRUCTION.

The Dallas County Clay Co. has started active construction on their new hollow block plant, and will use the famous Des Moines Shale in manufacturing their product.

The Trautwein Dryer and Engineering Co. has designed a modern plant for his company, including a waste heat dryer, down draft burning kilns and electric drives.

The materials which this company will use are well known, as the original plant which was on this location has been marketing their products for ten years past.

THE SEWER PIPE BUSINESS

THE SEWER PIPE business, while it has had its fluctuations, the production some years going below that of previous years, they have not been so wide or so frequent as in brick making proper, and the sewer pipe trade has shown a pretty steady gain during the last twenty years.

The geological survey reminds us that the brick business has more than doubled in twenty years. The sewer pipe business has done even better than that. Twenty years ago, in 1894, the total value of sewer pipe manufactured in the United States was $5,989,923. The total production for the year 1914, was valued at $14,014,767. The sewer pipe business has really shown a gain in this country of practically an average of half a million dollars a year, taking either the twenty year period or the ten year period. There is appended herewith the figures for eleven years beginning with 1904 and ending with 1914 which tells the story of the growth of sewer pipe manufacture.

Sewer Pipe Production.

1904	$ 9,187,423
1905	10,097,089
1906	11,114,967
1907	11,482,845
1908	11,003,731
1909	10,323,324
1910	11,428,696
1911	11,454,616
1912	12,147,677
1913	14,872,103
1914	14,014,767

These figures are particularly interesting when we take into consideration the fact that concrete has entered sharply into competition with burned clay for sewer making during this period. The competition of concrete has really been divided in this work, part of it being towards sewer pipe proper and part of it being in competition with brick used in constructing the larger sewers. In the sewer pipe varying from 12 inches to 36 and even 40 inches, concrete in some instances has replaced or rather takes the place of lots of burned clay. Of course it has had its run in favor and some reaction, and part of this trade has been regained, but taking it altogether the concrete has undoubtedly cut into the sewer pipe field materially in the larger sizes as well as entered into competition with brick in the still larger sewers.

Now when we consider that notwithstanding this loss of some of the trade to concrete the sewer pipe business has continued to make gains, gains that average half a million dollars a year, it is evident that the use of sewer pipe is increasing somewhere, somehow. A study of the industry shows that the big increase, the thing that has kept the sewer pipe business going even in spite of the inroads made by concrete, is in the demand for smaller sizes especially of the 4 and 6 inch size. This is a direct result of better sanitation and a more extensive use of bath rooms and running water in houses. The increased call for sewer pipe of small size, for drainage, has been the most remarkable feature of the business. These small sizes do not count up into dollars as rapidly as the larger sizes so when we consider the gains and total value made in the face of competition of cement we can begin to realize something of the wonderful increased call for the smaller sizes in sewer pipe.

It is perhaps safe to prophesy too that this increase in the call for smaller sizes will continue. Quite a lot of the demand heretofore has been for city trade and now the bath room and running water idea with all that it involves in the way of sewering is spreading out in the country district, not merely to the smaller towns, but also to the farm houses. So the future of the sewer pipe business looks good, it looks encouraging for still further enlargements, and that it is a branch of the clay working industry that will keep in step and will continue to make a good showing as compared to other lines of clay products.

ANALYZING CLAY AND PHYSICAL TESTING

By W. W. Phillips

CLAY IS LARGELY the product of the decomposition of feldspathic rocks. Feldspar is a silicate of aluminum, potassium and sodium. It also usually contains oxides of iron, calcium and magnesium. It may be mentioned that all minerals that contain these constituents are not clay. For instance, mica contains the same elements as those above mentioned, but in different proportions.

The silicates are hydrated and therefore contain 6 to 15 per cent. water.

A mechanical analysis is often of great value and a few simple rules that can be applied by anybody will be given at the end of this article.

In making a chemical analysis of clay the determinations are ordinarily confined to moisture, combined water, silica, alumina, iron oxide, calcium oxide, magnesia, potassium and sodium.

In making a determination of these constituents, it is best to grind about fifteen grams of clay to an exceedingly fine powder in an agate mortar. One gram is the weight of one cubic centimeter of pure distilled water at a temperature of 4 degrees C. A cubic centimeter is .061 cubic inch. All chemists use the metric system of weights and measures, therefore I think it proper to explain the meaning of terms that may be unfamiliar to some readers.

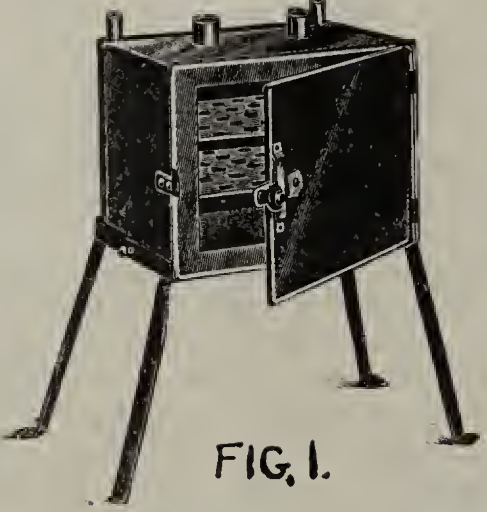


FIG. 1.

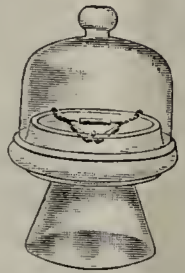


FIG. 2.

FIG. 3

FIG. 4

After grinding the material thoroughly, heat it one hour in an air bath at 100 degrees C. The air bath is shown in Fig. 1.

Cool it in a dessicator, shown in Fig. 2, and weigh on a watch glass, Fig 3. Now return the watch glass to the air bath and heat fifteen minutes longer at 100 degrees, cool and weigh as before. If the weight is exactly as the first weight, this may be regarded as a constant weight with the moisture removed. If a loss of weight is shown in the second weighing, the operation must be repeated until a constant weight is obtained. The difference between the first and final weight is the amount of moisture contained in the sample.

It will, of course, be understood that the sample used for all these determinations should be thoroughly dry—that is air dried. The dry sample should be transferred to a dry tube or bottle to be used for the other determinations.

The next step is to determine the amount of combined moisture. This is different from that just determined. It is chemically combined with the clay and is not driven off at 100 C. as in the first case.

Weigh two grams of the dried sample in a platinum crucible. Crucible shown, Fig. 4.

Ignite the sample twenty minutes, keep the crucible cover on, cool in a dessicator, and weigh as soon as cool. Then ignite the sample, say five minutes longer, and weigh again, when cool. When a constant weight is obtained, calculate the percentage of combined water from the loss in weight.

It should be understood that when the chemist uses the word "ignite," he doesn't mean it in the sense it is commonly used, he only means to heat intensely. When a crucible is heated intensely, it, of course, cannot be handled with the bare hands. Crucible tongs must be used for moving hot crucibles. Fig 5 shows what is known as Blair's crucible tongs.

To determine the silica in a sample, weigh out one gram of the dry sample, mix it with five grams of sodium carbonate and potassium carbonate. This is commonly known as fusion mixture. Silica, of course, is very difficultly fusible, but by adding the carbonates the fusion point is appreciably lowered. Mix the sample and the carbonates thoroughly, introduce into a platinum crucible and heat over a Bunsen burner until the mixture begins to cake and then ignite intensely over a blast lamp until it has been in a quiet state of fusion for some time—several minutes. Pour the fusion out of this crucible into another one floating on water, cold water. It will solidify when it strikes the cold dish and will not adhere to it. The small quantity of fusion that will perhaps remain in the crucible may be readily removed with hot water and hydrochloric acid.

The fusion should be dissolved in water, the solution acidified with hydrochloric acid. This solution should be heated until the acidulated water is completely evaporated—that is, evaporated to dryness, as it is ordinarily expressed. Heat then at 130 degrees C. until there is no longer an odor of hydrochloric acid given off. Now add fifteen cubic centimeters of concentrated hydrochloric acid and heat gently to dissolve any iron that may be contained in the sample; now add fifty cubic centimeters of water, heat to boiling, allow the insoluble matter to settle and filter. Wash thoroughly on the filter with hot water. It should be understood that "washing," as here used, means simply to direct a stream of water on the material to be washed, from the wash bottle, as shown in Fig. 6. By blowing in the tube pointing upward, the water is forced out of the tube pointing downwards. The material to be washed is ordinarily placed on a piece of filter paper, the filter paper placed in a glass funnel and the stream of water is directed on the material to be washed. All of the matter soluble in water passes through the filter paper—the insoluble matter remains on the filter.

After the matter has been thoroughly washed (in determining the amount of silica) wrap the paper around the precipitate, place them in a platinum crucible and after igniting over a Bunsen burner, ignite intensely over a blast lamp. Cool in a dessicator and weigh, the entire residue at this point is silica. From the weight it is easy to calculate the percentage of silica.

In making the determination of silica, a quantity of filtrate has accumulated. From this filtrate we determine the amount of alumina present in the sample. First, heat this filtrate, then add a few drops of concentrate nitric acid, then a slight excess of ammonia while stirring continuously.

Explanation.—Adding excess of ammonia or acid means to add enough to change from acidity to alkalinity or vice versa. In this instance it means to add enough ammonia to neutralize the acid, plus enough to render the solution faintly alkaline. In order to determine whether the solution is acid or alkaline, an indicator is ordinarily used. The most commonly used are litmus, methyl-orange and phenol phthalein. Litmus turns red in an acid solution and the blue color is restored by an excess of alkalies. Methyl-orange is used in a solution of alcohol. In alkaline solutions it possesses a yellow color; with a very slight excess of acid, it changes to reddish pink. Phenol-phthalein is very sensitive. In an acid solution no color is produced, but with a trace of alkali, an intense red is produced. These indicators can be bought of any chemist or may ordinarily be ordered through a local druggist.

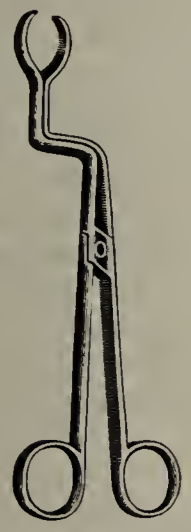


FIG. 5

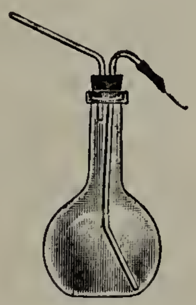


FIG. 6

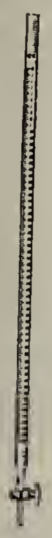


FIG. 7

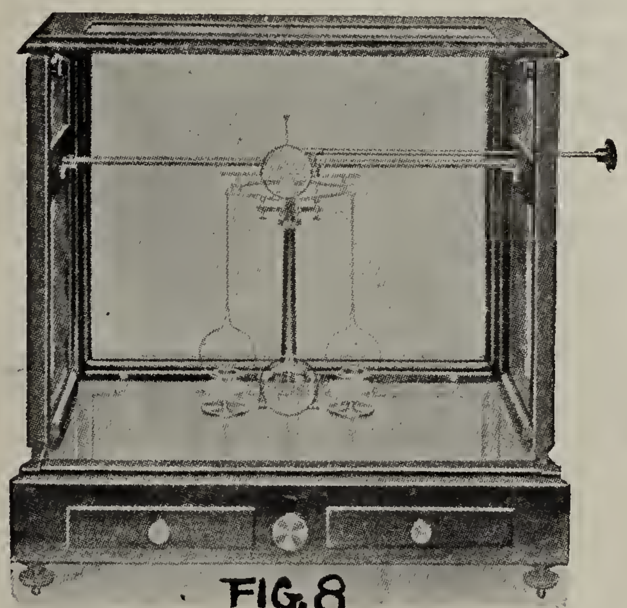


FIG. 8

Continue to boil the solution a few moments after adding the excess of ammonia. When the precipitate has settled, decant the clear liquid through a filter, then transfer the precipitate to the filter and wash it with hot water. Wrap the filter around the precipitate, place in a platinum crucible, burn off the paper, ignite over a blast lamp, cool in a dessicator and weigh. The ferric oxide is determined next, and this deducted from the two oxides is, of course, the alumina.

Explanation.—Decantation means simply to pour off gently. For instance, if a mixture of salt and sand are vigorously shaken in a quantity of water and the sediment allowed to settle, the fluid may be carefully poured, or decanted off, leaving the sand in the bottom of the vessel. The salt being soluble, is poured off and may be separated by evaporating the water.

To separate the ferric, or iron oxide, from alumina, fuse the precipitate with approximately eight times its weight of acid potassium sulphate, heating the fusion, and heat the fusion for a few minutes; when cool, add an amount of sulphuric acid equal to the volume of the fused mass, and heat gently until the contents of the crucible become a little more fluid. Cool and place the porcelain dish containing hot water and heat gently until the contents of the crucible are thoroughly dissolved. Transfer them to a flask, add, say fifteen cubic centimeters of pure dilute sulphuric acid and ten grams of granulated zinc, put a funnel in the mouth of the flask and stand the flask in a moderately warm place until the iron is reduced. Filter through a large filter, wash this by filling it with cold water and allow it to run through into the main solution and titrate at once with potassium permanganate.

Explanation.—Titrate means to measure by means of solutions of known strength. To give an instance of its use: Take two burrettes, as shown in Fig. 7; clean them carefully. Fill one up to ten cubic centimeters with a carefully measured solution of sulphuric acid and the other with an equally carefully measured solution of sodium hydrate. Sodium hydrate is an alkali and it neutralizes the acid. Run, say five cubic centimeters of sulphuric acid in a test tube, and then add a few drops of phenol-phthalein; notice no color is produced. Add slowly the sodium hydrate, drop by drop until a red color is imparted to the solution. If both of these solutions were what are known to chemists as "normal solutions," exactly five centimeters sodium hydrate would neutralize five cubic centimeters of sulphuric acid. But, at any rate, it will always take exactly the same amount of an acid solution of a known strength to neutralize a solution of alkali of a given strength. This is the principle of titration.

To titrate with potassium permanganate in this case, it is necessary to make a blank determination, which is done as follows:

Take the same weights of acid potassium sulphate and sulphuric acid as were used in fusing the precipitate of iron oxide and alumina and heat slowly until the bisulphate is completely dissolved. When the solution is cooled, take it up in water, transfer the whole to a flask and add zinc and sulphuric acid in the same amounts as were used in the regular determination, put a funnel in the mouth of the flask, and allow this solution to stand the same length of time as the main solution. Filter, wash the filter paper and titrate with potassium permanganate. Deduct the amount of permanganate consumed by the blank from the amount used in the regular determination; the remainder represents the amount used in oxidizing the iron in the sample. From this, calculate the weight and percentage of ferric oxide in the sample. The weight of the ferric oxide obtained in this determination, subtracted from the combined weights of the iron oxide and alumina, indicates the weights of the respective constituents.

If the filtrate from the previous determination materially exceeds 250 cubic centimeters, it should be evaporated until it is approximately that quantity. Boil gently and add five

(Continued on page 622.)

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give a paper read at the last convention of the Illinois Clay Products Manufacturers' Association.

PRODUCTION OF FINER GRADES OF STONEWARE FROM ILLINOIS STONEWARE CLAYS.

By R. R. Danielson, Urbana, Ill.

THE market for crude stoneware has been rapidly falling off of late years due to its replacement by glassware, which seems to be in greater demand by the trade. The industry generally is in a serious condition, and steps must be taken to protect the investment in the stoneware plants. The solution of the problem lies in the development of new kinds of ware. Furthermore, the deposits of No. 2 and No. 3 fire clays are very extensive in this state, the clays being very well adapted to the manufacture of the following products, any one of which would make a very marketable product:

1. Decorated pottery.
2. Chemical stoneware.
3. Floor and wall tile.
4. Cooking ware.
5. Special terra Cotta.
6. Enameled brick.
7. Face brick (buff and flashed).

Decorated pottery is especially in demand by the florist trade and any line of art ware is marketable if the designs and glazes are good.

Chemical stoneware is another product very much in demand, particularly since the war has shut off our supply of foreign made ware. This is particularly true of Illinois, which has no manufacturers in this line, but has a splendid market in Chicago, all the ware being shipped in from the eastern states.

Stoneware clay is suitable for the manufacture of such products as floor and wall tile since this clay can be burned to a good dense body without warpage, to which glazes can be easily applied. By the addition of stains to a stoneware body, excellent vitreous floor tile can be obtained in all colors, with the exception of white tile.

Good enameled brick can be made from these clays, as has been demonstrated by the few enamel brick factories in Illinois. The manufacture of buff and flashed brick is another desirable field, all brick of this type being shipped in from neighboring states and commanding a very good price.

Trade conditions similar to those of our stoneware industry of Illinois arose in the Bunzlau district of Germany about 1909. The problem was attacked by Professor Pukall, of the Royal Ceramic School of Berlin, who succeeded in producing new uses for their stoneware clays which are no better than our own Illinois clays. The latter have excellent working qualities, working admirably in the casting or jiggering process and giving good results when worked in the auger machine.

However, for finer grades of ware there is one point in the preparation of the clay that is very important and that is the matter of washing the clays. The stoneware clays, as a rule, contain pyrite, sand and mica. The mica is not detrimental to the body but the sand is in a coarse condition, and would affect the working properties and density of the body and, therefore, should be removed. Pyrite is the most harmful one of the three, and must be removed. If not removed, it forms black specks in the body and for that reason must be screened out, if finer grades of ware are to be made.

In our work, Whitehall, Lowell and Colchester unwashed clays were used, these three being selected because they were considered as being typical of the Illinois clays. A screen test was made on these, by first blunging up the clay and then passing a weighed portion through a 150 mesh screen, washing with water until all the finer portion had passed through the screen. The residue was dried and weighed, and its percentage of the original sample calculated.

The results are given below in comparison with an analysis of German stoneware clay made by Professor Pukall:

Bunzlau Clay on 240 mesh screen.	
Residue	26%
Material passing thru	74%

Washed Clay	
Clay matter	74%
Flint	21%
Quartz	1.1%

Illinois Clay on 150 mesh screen. Colchester	
Residue	10%
Material passing thru	90%

Whitehall	
Residue	6%
Material passing thru	94%

The 150 mesh screen was used because it was considered fine enough for all practical purposes. A body was prepared from each of these washed clays according to the following composition:

Washed clay	62%
Flint	26%
Feldspar	12%

The bodies prepared from the Whitehall and Lowell clays according to the above composition worked well in the jiggering and casting processes. However, the body prepared from the Colchester clay was rather short, and cracked in drying because of low strength. A new body of the following composition was made up from the Colchester clay, and this worked very well:

Washed clay	90%
Feldspar	10%

Pieces were then cast and jiggered from these prepared bodies and biscuited in a coal fired muffle kiln to cone 4, although biscuiting to a lower temperature would be just as well, e. g., cone 05. In the burning of stoneware clays, however, there is one point to bring out, and that is the oxidation period. Most stoneware clays are highly carbonaceous, and for that reason must be thoroughly oxidized at 1,290 degrees F. before proceeding to a higher temperature. In the small kilns at our laboratory, about one-fifth of the time of the whole burning period of 30 hours is necessary to oxidize pieces one-half inch thick. After oxidation, a reducing fire may be used if the color of the body is not very important, and the gray color of much stoneware is evidence of reduction during burning. However, the more common and best method of procedure, is to burn with alternate oxidation and reduction, finishing the burn with a good oxidizing fire.

Biscuit burning, however, is only necessary in the stoneware industry, where decorated wares with sensitive colors are produced. Ordinarily, the product should be a single fired ware. For instance, the old Chinese porcelains which were really fine stoneware, were finished in one burn, with excellent results, the glaze being applied to the green body.

A typical stoneware glaze used on the bodies mentioned above has the following composition:

Glaze A.

Potash Feldspar	267
Kaolin	57
Flint	89
Whiting	40
Magnesium carbonate	10
	463

This composition gives an excellent glaze at cones 7 to 9. It has a good gloss and is entirely free from any defects common to this type of glaze.

With this glaze as a basis, a variety of colors can be produced, by the addition of various amounts of coloring oxides. Some of these are as follows:

	Glaze A	403
Brown—	Red iron ox	23
	Rutile	46

Blue	3 to 5 % cobalt oxide
Green	5% chromium oxide
Metallic-brown	5% nickel carbonate
Crystalline-red-brown	8% iron oxide
White	7% tin oxide

The white and brown glaze, as given above, make an excellent combination for cooking ware. A good colorless glaze (B) fusing at cone 7-9 has the following composition:

Glaze B.

Potash Feldspar	111
China clay	52
Flint	114
Whiting	70
Magnesite	8
	355

This glaze has the added advantage that it is particularly adapted to underglaze and overglaze decoration. Excellent results were obtained with all of the above glazes on the prepared stoneware bodies.

A special type of glaze which makes beautiful decorative ware and which brings a good price, is the crystalline glaze. Glaze A with 8% of iron oxide gixes fine golden crystals of Fe_2O_3 and makes a very desirable glaze for decorative ware. Excellent crystalline glazes may also be obtained with the following composition:

Fritt	101
Whiting	10
Magnesia	10
Ball Clay	7¾
Flint	26
Rutile	5

The fritt has composition of:

ZnO	45
Borax	29
Soda	13¼
Flint	30
Cobalt ox or Copper ox	4

Cobalt oxide gives beautiful blue crystals while green crystals are obtained with the copper oxide. The best results are obtained by first coating the ware with either glaze A or B given above, or by using a glaze made up according to the formula of Seger cone No. 4:

$$\left.\begin{matrix}.3\ K_2O\\ .7\ CaO\end{matrix}\right\}\ .5\ Al_2O_3\ (4.0\ SiO_2$$

The batch composition of this is as follows:

Feldspar	167.1
Whiting	70.0
Kaolin	25.8
Ball Clay	25.8
Flint	108.0

One of the clear glazes given above should be sprayed on the entire piece and the crystal glaze painted or dipped on over this, preferably around the top of the piece and about one-fourth of the way down the sides. It is necessary to dip this crystalline glaze about ¼-in. thick as it flows readily, due to low viscosity because of the small amount of Al_2O_3 present. For best results this glaze should be fired to cone 7 or 8 and must be cooled slowly, such cooling conditions being obtained more easily in a commercial kiln than in a small test kiln.

A unique matt crystalline glaze may be obtained with the following composition:

Glaze B	100
Magnesite	20
Rutile	20
Cobalt oxide	2

Another type of glaze much desired in decorative ware is the true matt glaze, obtained with the following composition at cones 7-9.

Feldspar	150
China clay	70
Flint	6
Whiting	73

The matt type of glazes are best applied by spraying.

The above work gives some idea of the possible uses of stoneware clays and there is absolutely no reason why bodies thus prepared and coated with a good hard glaze, could not be used for chemical stoneware, casseroles, condensers, acid cocks, electrical insulators and similar products as well as in the production of the so-called art ware. Any one of the above lines could be manufactured without much change in the present equipment of the stoneware plants, which is the main point to be considered in changing from the manufacture of one kind of ware to another.

RESEARCH WORK IN ENGLISH POTTERIES.

An interesting phase of the pottery industry of England, and especially of the work at Stoke-On-Trent, has been reported by Consul Robert S. S. Burgh, of that place.

He says that for some time there have been negotiations looking to the establishing of a school and research work in connection with the pottery industries and now the preliminary funds are in hand and more will be available as soon as estimates are completed.

The proposition is to erect an experimental factory adjoining the pottery and mining schools near Stoke Station which will be used for exhaustive research work for the benefit of the pottery industry. The principal of the pottery school will also be engaged in the work with a committee of manufacturers acting under the authority of the governing body.

It is thought that out of this research work it will be possible to accomplish results that were not practical for individual manufacturers working singly and it is hoped it will enable the British manufacturers to compete with the German Feldspar china.

The idea is also being entertained of investigating the subject of porcelain for insulating purposes.

PRODUCTION OF FULLER'S EARTH INCREASES.

One result of war and its interference with ocean going commerce has been to increase the activities and the production in domestic Fuller's earth. The production in 1915 was 47,901 tons valued at $489,219. As compared to 1914 this was an increase of 6,920 tons at $85,573, which made the domestic production more than double the amount of imports. Moreover the average price of the domestic production has been better than that of the imported product. Fuller's earth is mainly used these days in clarifying oils, fats and greases. The main product comes from Florida, but five other states participate in the production, Arkansas, California, Georgia, Massachusetts, and Texas.

Dry Pressed Firebrick.—In making dry pressed firebrick, the cost of making is much less than in making stiff mud or hand made brick in as much as the dry pressed brick can be set at once in the kiln. After a great deal of actual trials between hand made and dry pressed brick it has been found that there is no material difference in the two kind of firebrick, and that it is well worth for fire brick manufacturers to see if their clay will make dry pressed brick.

—Deut. Topf & Z. Z., 9-10, 1916.

Written for The Clay-Worker.

CLAY NEWS FROM THE SOUTHLAND.

THROUGH THE CENTRAL SOUTH the summer aspect is very good on brick work. The brick manufacturers are running their kilns at most points, contractors are beginning, finishing or planning work. The pottery concerns at most of the towns and cities visited by your correspondent are active, employing large forces of employes and finding good, steady markets for their product, though at rather close margins of profit, they state. The bad spring weather has retarded work to such an extent in the spring months that it seems brick construction will be quite large in most southern cities during June, July and August.

The Paducah Pottery Co., at Paducah, Ky., was visited a few days ago. Mr. Howard, an officer of this company, states that their 1916 business has shown a large improvement over 1915. January, to begin with, showed an improvement, February doubled and March made a good showing, as did also April and May. They are utilizing Illinois clay. Jars, jugs, flower jars, all kinds of pottery goods are turned out.

The Paducah Clay Co., with offices in the Fraternity building on Broadway, is engaged in the mining of clay.

Memphis Knights of Columbus contemplate building a new home in 1916. They own valuable realty and contemplate a building to cost about $100,000.

R. E. Manogue has begun the erection of a brick and stone residence in Morningside Park, Memphis, to cost about $20,000. The house is to be completed by August 15. Tom Turpin is supervising the construction. The entrance will be direct from a walk into a vestibule. There will be four bed rooms up stairs and a large living room, dining room and breakfast room down stairs.

A two-story, fireproof brick school house, costing $50,000, is to be erected at Millington, Shelby county, Tenn. Plans for the structure have been drawn by Architects Hanker and Cairns, Scimitar building, Memphis.

Contract for the postoffice building at Humboldt, Tenn., has been awarded to Alernon Blair, his bid being $41,923.

The LaBelle Place Baptist Church, at Memphis, Tenn., South Wellington and Edith Place, will be a structure of the season and will cost $35,000. Red pressed brick and cut stone trimmings will be used. Rev. D. A. Ellis is pastor.

Plans have been drawn at New Orleans for a new home for the Benevolent Knights of America, Louisiana branch, to be built on North street, facing Lafayette Square. The building will be five stories high and the outside walls will be of stone, mottled terra cotta and rough texture pressed brick, topped with ornamental cornices and balustrades. The second, third and fourth floors will be equipped into modern lodge rooms.

Architects Asmus and Norton, of Nashville, Tenn., are preparing plans for five store buildings in that city, on Sixth avenue, near Union. Each small store with brick and terra cotta exteriors.

The Euclid Realty Co., of Nashville, will erect a brick apartment building on Thirtieth avenue, near West End, at a cost of about $25,000. Foundation, Foster and Creighton Co.; brick work, Bush Building Co.; plastering, Southern Plastering Co.

The contract has been awarded at Nashville for a three-story brick apartment, Elliston Place, for Normal Farrell, Jr., and Thos. W. Smith. General contract to Foy-Proctor Co., of Nashville.

The contract for the moving picture theater building at Clarksville, Tenn., has been awarded to the Elliott Construction Co. Architects Marr and Holman, of Nashville, drew the plans.

Judge Robt. Burrow will have erected a $7,000 brick residence at Johnson City, Tenn.

Hugh Boswell, at Lexington, Tenn., will build a seven-room, two-story brick residence.

Much building is being dcne at Nashville, and T. L. Herbert & Sons report active market in brick, sand and gravel.

Some figures of Nashville pottery interests say that Nashville does an annual pottery business of $40,000; $50,000 is invested; 50 persons are employed and are paid a total in annual salaries of $15,000. Pottery made in Nashville sold in eleven states. Business is growing rapidly and plans are being made to double the capacity of the plant. The concern makes its pottery from clay secured at its own mines at Henry, Tenn. With the exception of Louisville and Paducah, Ky., Nashville is the most important pottery manufacturing plant in the South.

The Fulcher Brick Co., of Nashville, are the general contractors on the Tennessee Polytechnic Institute at Cookeville, Tenn., under erection. The plastering is being done by F. H. Polk, of Nashville.

The Bush Building Co., of Nashville, Tenn., have the contract for the brick addition to Belmonth College.

T. C. Webb, traveler for the Harker Pottery Co., of East Liverpool, Ohio, recently left Nashville for a thousand-mile trip on horseback in the Cumberland mountain territory. He made all the leading towns and trading points. While some of them are reached by railroad, many important towns can only be reached by overland travel.

The Salmen Brick and Lumber Co., of New Orleans, La., has shipped several good orders to Central American territory and the Panama country and general business along the coast is reported as being good.

D. Dermon, at Memphis, will erect for his own use, at 615-17 Monroe avenue, two-story and basement building to be finished in terra cotta. DIXIE.

The Lowering of Vitrification Points. The Electro-Osmose Co., of Frankfort-on-Main, has obtained a German patent for a new process by which it is possible to reduce the vitrification point of various clay products. Through the Electro-Osmose process, materials are brought in colloid form, and the longer the suspension in colloid form under this process has been made, the finer the particles will be and vitrification will set in much quicker, but fusion will be retarded. The following table shows what the process can do. A magnesium-silicate material was tested under these conditions. Under regular condition it absorbed at cone 12 still 12.55 per cent. If the process was applied to colloid form 5 hours, then the absorption was reduced at the same temperature of cone 12 to one four-thousandth part of one per cent, while if same was suspended 12 days, there was no absorption at all. The material showed that its range of vitrification was very low, for by cone 18 it still had an absorption of 7.54 per cent, while it melted already two cones higher. By using this new process it started to vitrify by cone 5a and did not melt until cone 20 was reached.

Percentage Absorption.

Seger cone	No. 1	No. 2	No. 3
01a	15.36	26.62	20.00
5a	17.91	16.05	0.022
9	14.13	6.36	0.001
12	12.55	0.004	0
14	11.11	0.002	0
16	9.58	0.001	0
18	7.54	0	0
20	melts	melts	melts

—Zentralblatt fur Baukeramik No. 892, 1915.

While there was an interruption to the imports of certain clays that caused some trouble in certain lines, still we have been importing clay even during the war period. Our clay imports for the fiscal year ending with June reached a total of $1,938,812, as compared to $2,246,807 for the previous year, not such a heavy falling off as one might expect from current reports.

BRICK PAVEMENTS BEST.

Portsmouth a Case in Point—The Plants That Have Made Brick Streets and Roads Popular in Southern Ohio.

PORTSMOUTH is one of the oldest and most substantial cities in Southern Ohio. Her leading citizens are conservative, yet enterprising. They believe in permanent rather than temporary improvements, as is well demonstrated by the municipal buildings and all public utilities. One feature of the city's development is particularly interesting. Portsmouth is a brick-paved city, all the improved streets are paved with brick, to the exclusion of all other materials. Her taxpayers have learned that a brick-paved street is an asset, not a liability. In other words, the first cost is the only cost, there being no repair bills and no expense for upkeep.

Some of the city's streets were paved with brick twenty odd years ago, and though subject to fairly heavy traffic, they are still good, sanitary, satisfactory thoroughfares. Of course, modern methods of construction provide better pavements than did the methods in vogue in early times. For this reason, the streets of Portsmouth paved in recent years, and according to the specifications of the National Paving Brick Manufacturers' Association, are smoother and cleaner than the old pavements. Especially is this true of the pavements laid with Dunn lug brick, but the brick streets of Portsmouth, both old and new, are good, so good that the city fathers, and mother's, too, are entirely satisfied with them and will continue to use vitrified brick exclusively within the city limits and beyond. Several miles of brick pavements have been laid on the country highway approaching the city and they have proven so satisfactory that there is a demand for similar improvement throughout that section. One of the city institutions of which all the people of Portsmouth are particularly proud is the city fire department. It has a fine record for efficiency, and one of the important elements in that efficiency is the good brick streets which permit of rapid runs in response to fire alarms at all seasons and in all kinds of weather. Horses do not slip and autos do not skid on brick pavements, as they do on asphalt and wood block, especially when the latter are wet, at which time they are really dangerous, and that is one reason why brick streets are popular in Portsmouth, for they afford safe and easy traction under all weather conditions. The accompanying view of one of Portsmouth's fire houses and the brick-paved approach is a mute witness of the superior merits of brick paving.

Portsmouth's Fire Laddies Who, Believing in Safety First, Declare Brick Streets the Best on Earth.

Portsmouth's Paving Brick Plants.

Another reason why paving brick are popular in Portsmouth is that the people appreciate and believe in supporting home industries, and there are three excellent paving brick plants in the immediate vicinity owned and controlled by Portsmouth capital and furnishing employment at good wages to thousands of workmen. The city lies on the north bank of the Ohio river and is surrounded on the north and east by immense hills, veritable mountains of shale and fire clay from which generations to come may take the raw material necessary for the production of vast quantities of brick, building brick, paving brick and fire brick.

The accompanying snap shots were taken during the recent visit to the city of the members of the Institute of Paving Brick Manufacturers. If the local manufacturers have seemed a little proud and self-important since then they are excusable, for they were complimented very highly by the visitors on the general excellence of their plants and the high character of the products. Guided by G. E. Carlyle, the visitors were shown through the shale and fire clay mine of the Carlyle Paving Brick Company, which lies half a mile or more distant from the plant. The shale is blasted, carried down the side of the hill in chutes and from there conveyed in cars hauled by "dinkey" engines to the plant which is equipped with a Freese brick machine and cutter, Bonnot presses, Stevenson pans and other equipment giving them a daily capacity of 40,000 blocks per day.

The company has recently taken over the management of the Portsmouth Paving Brick Company, a smaller plant, which is equipped with American Clay Machinery Company machines, Freese cutter and pug mill, Phillip & McLaren dry pan and Bonnot press. The daily capacity of this plant is 22,000 brick. The shale for this latter plant is hauled by wagons a distance of a mile or more. This is conceded to be a handicap, but not a serious one.

The Peebles Paving Brick Company manufactures 80,000 ten-pound blocks per day, taking the shale for same from the

Steam Shovel Up Against a Hard Proposition.

The "Dinkey" Hauling a Train of Empties.

Some Fine Specimen of Perfect Brick.

Visitors Enjoying the Ups and Downs of Plant Inspection.

side of a hill, using a steam shovel which has to eat its way into a rock-like surface. The plant or plants, there are practically two of them, are equipped with four Bonnot Canton special brick machines, two twelve-foot Bonnot pug mills, two Freese cutters, and the usual equipment of clay cars, etc., that go to make up the modern up-to-date paving brick plant.

The brick are dried in tunnel dryers, installed by the L. E. Rodgers Engineering Co., Zanesville, Ohio, and go to the kiln bone dry. This doubtless is one of the reasons for the high percentage of the pavers produced. At any rate, the visitors were impressed with the excellent quality of pavers turned out in each of the plants. There were few seconds or culls in evidence, and there was an orderly tidiness manifest throughout each of the plants, that is an indication of good management.

The visitors evinced especial interest in the immense Haigh continuous kiln which is a remarkable example of thoroughness in construction. It consists of sixty-nine chambers having a total capacity of nearly one million brick. At the time of our visit the plant was running exclusively on Dunn wire-cut lug brick.

They are operating another plant at Firebrick, on the Kentucky side of the river, known as the "Dixie" plant, with a daily capacity of 40,000 block.

One pleasing feature noticeable to all was the cordial good fellowship between these competitors. Messrs. Carlyle and Peebles are friends and are always found working together for the good of the cause, and in the interests of the community. It is a happy condition that spells success and should be emulated by clayworkers generally.

MEETING OF THE EASTERN PAVING BRICK MANUFACTURERS' ASSOCIATION.

The members of the above association held a quarterly meeting at the Fort Pitt Hotel, Pittsburgh, Pa., recently, and enjoyed a day of conferences during which various phases of the industry were considered and discussed pro and con. The president, G. W. Greenwood, of Uniontown, Pa., in an informal address made some very pertinent suggestions for further work, which met with a hearty response, especially that of holding meetings at regular intervals. We are pleased to record his observations and commend same to the consideration of the paving brick craft.

President Greenwood's Address.

Instead of meetings at irregular intervals, it will be greatly to our advantage to have stated meetings at regular intervals, say a meeting every two months, and on a certain day of the month, so that members could keep the date clear.

Committees will do more and better work if called upon every two months for a report until their work has finally been completed.

Again, the more frequent gathering together of the members will create a still better feeling, a spirit of co-operation and less of antagonism, and the interchange of much useful information concerning problems common to all, and their possible solutions.

We are still in a state where we guess at what our competitors are going to bid on a certain work, and then bid just as much lower as we deem it necessary in case we are in need of that particular work. This makes it possible for the purchaser to play one manufacturer against another, to the decided disadvantage of both.

Information from another manufacturer should be more reliable than information from the purchaser. This condition will not necessarily come very quickly, but repeated association in meetings will produce it in groups as suspicion and distrust evaporate, until finally the pressure of opinion will curtail, if not altogether eliminate, unfair methods of competition.

These are but a few of many advantages which will occur to you resulting merely from the frequent regular association of members one with another. Needless to state, these results will follow no matter how few may unite in these meetings. At the same time, the greater the attendance, and the larger the membership, the more advantageous it will be to all. It is a question for the association to decide if it will be better to maintain nominal annual dues and thus accumulate a surplus fund by force of numbers, or to multiply the annual dues and curtail the membership. With increasing results to the members, there will come a corresponding increase in payments, so long as the manufacturer can see that his contribution is coming back to him in definite results right at home.

There are so many things which can be done with advantage by the association, rather than by individual members, that one could scarce take time to mention them. One subject of interest is our relation to the new Federal Commission.

From it, as an association, we can surely derive great assistance; for example, it might not be possible for all members to send each a representative to the commission, or for the commission to see all the representatives individually. But if one or more of the representatives of this association were to get in touch with the commission, it would pave the way for continued co-operation between the two bodies, and with frequent membership meetings of our association, such as outlined above, the information so secured would be given out promptly, and discussed, with the result that new points could be suggested to be taken up with the commission before the next meeting of the association.

The attitude of the commission towards associations such as ours is indicated in the following paragraph from an address by Commissioner Harris last Tuesday:

"Concerns engaged in the same industry have much in common in improving processes of manufacture, standardizing products, establishing systems of accounting, obtaining credit information, and promoting the welfare of employes.

"By exchanging ideas, you broaden your outlook of business as a whole, and your combined knowledge and experience helps to solve many difficult problems.

Germany's Policy of Co-operation.

"Germany's success as a commercial world power is due very largely to the policy of organizing and co-operating. Her business men have worked together. They have established communities of interest among themselves for the mutual purpose of promoting trade at home and abroad. They have organized in every important industry trade associations, and into these are gathered 85 per cent. of the manufacturers engaged in the respective industries. This has proven to be the very backbone of Germany's industrial and commercial achievements. More than 600 associations of manufacturers, producers, and merchants exist in Germany today, and in addition to these there are about 5,000 subsidiary business organizations. The German government not only sanctions these industrial organizations but assists them in many ways."

We frequently hear of men who have accumulated some money, and instead of putting it into savings banks they put it into clay banks, seeming to feel that any kind of a bank is a safer place in which to put their holdings. There are probably more abandoned brick yards over the country than of any other industry.

The work of the commission in discouraging these enterprises which spring up like Jonah's gourd and wither in a night, but yet live long enough to cripple other plants, is indicated in the following paragraph from the same address:

"Knowledge of existing conditions will prevent others from entering the business or unprofitably investing additional capital where overproduction already exists. The industry in which conditions are unsatisfactory will receive par-

The Temporary Office of the Peebles Paving Brick Co.

A Carload of "Black Diamonds."

Pavers on the Way to Kiln From Dryer.

A Smiling Contest, George Ohr and G. E. Carlyle in the Lead.

ticular attention and the real cause of the conditions will be ascertained."

A recent magazine article gives Commissioner Hurley as authority for the statement that a surprisingly large number of failures result from improper accounting methods. A proper system should be like the observations of the course of a ship from which the officers determine what progress has been made since the preceding day, and what course they should steer the following day.

The subject of Cost Finding has been before this association for the past two years, and its importance is such that it should continue to be before us for all years to come.

What the commission has to offer on this subject is indicated by the following:

"The number of small manufacturers who have no adequate cost accounting system and who price their goods arbitrarily is amazing. Proper accounting for the small manufacturer is most essential. It is necessary for his success that he know on what particular article he is making a fair profit and on what he is making only a narrow margin of profit or losing money. If he has this information he can concentrate on the manufacture and sale of the product on which the profits are satisfactory.

Whole industries, in many instances, are suffering from a general lack of intelligent knowledge of cost.

How can the Federal Trade Commission help to improve this situation? The commission has no intention and no desire to use compulsory methods. But it does hope to reach the desired end by encouraging improvements in accounting practice, by indorsing standard system of bookkeeping and cost accounting, and by assisting in devising standard systems, either at the request of individual merchants and manufacturers, or through the association that represents the industry."

Still another subject to which the commission will give its attention is that of unfair competition.

"Section two of the Clayton Act declared discrimination in price between different purchasers of commodities to be unlawful under certain conditions. This section is especially interesting to manufacturers. It does not mean that the same price must be made to all customers, but it does mean that a manufacturer or dealer shall not make low prices in the places where he has competition for the purpose of putting the competitor out of business. This kind of price cutting was one of the favorite clubs of certain powerful monopolies.

Section five of the Federal Trade Act makes the general declaration that unfair methods of competition in commerce are unlawful, and authorizes the commission to enforce this provision in all cases where the commission is of the opinion that the public interest is sufficient to require action by the Federal Government."

I would propose, therefore, that the association today designate times of meeting for the remainder of the year; that one or more representatives be chosen to go visit the Trade Commission, and make a report at the next meeting on different phases of helpful co-operation which can be undertaken between the commission and our association.

GOOD ROADS CONSTRUCTED BY CONVICT LABOR.

Every mile of good road requires a lot of brain and muscle to be used in its construction, and a big item in the total cost of road building is that of unskilled labor. The work is healthful and intersting, and so in many states where the profitable use of convicts in some uplifting occupation is a difficult problem, they are employed in road building. In the northeastern states there has been a marked opposition to this, however, due to several causes which collectively may be regarded as manifestations of the conservatism of long-established, wealthy communities. It is interesting to note, therefore, that the initial experiment with convict labor in Massachusetts last year was so satisfactory that undoubtedly such work will be continued, while in New Jersey, where the system has been under trial for several years, this favorable opinion has just been expressed by the state highway engineer: "The quality and quantity of work done in 1915 exceed, in proportion to the money spent, the previous results, and the experience gained during the past year will enable us to produce much more satisfactory results in the future." This merely confirms for the northeastern states what has already been demonstrated in the South and West.

TEACHING THE YOUNG THE IMPORTANCE OF PERMANENT HIGHWAYS.

Community welfare is so much aided by road improvements in Illinois, where the results of highway betterments have been watched critically for a number of years, that Hon. Francis G. Blair, state superintendent of public instruction, has published a 32-page bulletin on good roads for use in the public schools. It is based on the fact that the best way to bring about a reform is to educate the public to evince a desire for it. So this bulletin tells the teacher how to instruct his pupils to see what are defects and what are good features of the local roads. Then when they grasp what are the real defects in the roads, they are taught what are the remedies. In addition, the teacher is given suggestions concerning local exhibits and demonstrations to arouse an interest in road improvements, and there is advice on ways to encourage cleaning up the roadsides. Of course, it is not the Illinois school children who will take part in the road building of today. But they will build the roads a few years hence and until then they will have a certain influence on the old folks who still cling to the idea that lanes of dust and mud are an unavoidable feature of the country. The Illinois plan is not to teach road building along with the three R's, but to show what can be accomplished without excessive cost of labor, if the improvements are well planned and intelligently directed.

TIMELY HINT PREVENTS NATIONAL LEGISLATION INIMICAL TO PERMANENT HIGHWAY IMPROVEMENT.

Will P. Blair, secretary of the National Paving Brick Manufacturers Association keeps a close watch on the paving brick industry of the country, all the way from the little town council up to the Congress of the United States. The proposed bill under consideration by the Senate of the United States limited the cost of a road to $10,000.00 per mile, in the construction of which the government would contribute its share of its cost. Secretary Blair at once called upon the manufacturers of the country to inform their Senators and Congressmen how ineffective and ill advised such a limitation would operate in the improvement of a system of highways through the country. By prompt action in this matter the contents of letters written to the Senators were injected into the debate and the limitation removed. But for this action Congress seemed bent on rushing through a bill that would have dissipated in a most wasteful way the $75,000,000.00 proposed appropriation for road improvement. No class of road improvement at all approaching a permanent character can be built for $10,000.00 a mile. The time has come when we must stop putting public money into a mud hole.

Ten years ago the cement business was a mighty small item in the stock of the retail dealer in building material, amounting to only about .6 per cent. Today this has been increased by exploitation until in the average retail lumber yard the cement item amounts to 16 per cent., or ten times what it did ten years ago. The cement folks do not propose to stop at that, however, but are threatening to make cement the leading item in the retail yard instead of a trailer. Meantime this question is pertinent, what is being done to make brick an item of importance with the retail dealer?

GLAZING DRAIN TILE

To Withstand the Action of Alkali—Water in Alkaline Land.

By Anton Vogt.

WE KNOW there are in the United States millions of acres of alkaline lands to be drained and so, turning that vast area of virgin soil into crop producing land, to supply in part the steady increasing population of this country.

When this is done, those opposed to immigration and whose forefathers years ago came from foreign countries, need not feel any alarm that this country will be oversettled. Many millions more will have room to till the soil of these fertile lands. After the war, the European people will be over-taxed to pay the greatest war debts the world has ever known. They will look for the land of promise, happiness and prosperity The trend will be, or rather should be, to this land and I see the time when the European people of every nation will establish colonies. Their governments cannot hold them, but the United States government will assist them to come here.

Referring to the drainage of alkaline lands, the tile should be burned very hard or better salt-glazed, if they must withstand the action of the alkali water in the alkaline land. Generally, clay for salt glazing in these localities is extremely scarce. Cement, to make cement tile, can be had at reasonable prices and sand is plentiful, but cement tile in such land would be practically worthless; they would disintegrate and fall to pieces by the action of the alkali water and the alkaline in the land. Soft burned clay tile would not be better.

"What, Then, is the Remedy?"

Nothing but hard burned or salt-glazed tile will withstand the action of the alkali.

I do not mean that only salt-glazed tile will answer in alkaline lands. Hard burned tile will fill the bill, but the burning must be carried on with great care, stopping firing as soon as the tile are burned hard enough, for clay from alkaline lands has a very close range, between burning hard and fusing, owing, of course, to the alkaline impurities present.

Clay Suitable for Salt-Glazing.

To those who wish to salt-glaze their tile, I would advise to have their clay analyzed, to ascertain the percentage of alkalies. If found that the clay is low in alkalies, such as potash, soda, lime of magnesia, and if the percentage of aluminum is from 10 to 25 per cent and the silica (free) from 65 to 85 per cent, then such clay will make salt-glazed tile. Three times as much silica as alumina will take a salt-glaze, but four, five, or six, or even seven times as much silica as alumina will take a salt-glaze easier.

The writer has salt-glazed many clays in many different proportions of alumina and silica and has always found that clays containing five to seven times more silica than alumina glazed easier and with a heavier glaze, because such clays will fireflash or fireglaze from the heat, while clays high in alumina will not fireglaze with ordinary kiln heat. Fire clay proves this to be true. The proportion of alumina and silica in fire clays is not anything like in clays suitable, for instance, to salt-glaze sewer pipe. Such clays will fireflash more so with a reducing than with an oxidizing fire. While many know the meaning of these terms:

"Oxidizing and Reducing Fire."

It will do no harm and not be out of place to explain for those of your readers that don't know. An oxidizing fire is produced when the kiln has perfect combustion, created by strong draft and air in sufficient quantities, over the fires, so the carbon (the smoke) burns up, so nothing but blueish vapors, the product of combustion, escape the stack. Then you have perfect combustion or an oxidizing heat. A reducing fire is produced in just the reverse manner. The damper at the stack is lowered so much that the circulation in the kiln is nearly at a standstill, the fires are closed tight to exclude the air, thus creating imperfect combustion, then you have a reducing heat. "That's all there is to it."

"Hard Burned or Salt-Glazed Drain Tile."

Years ago the erroneous idea prevailed that drain tile should be porous to absorb the water. This theory has been exploded since it has been proven that the water enters at the joints. The present-day markets demand hard tile. In some states all the large sizes are glazed like sewer pipe and the cost is a trifle, perhaps a couple of dollars per kiln of 30 feet diameter.

As said above, clay suitable for salt-glazing must have a reasonably long range between vitrification and fusing, at least 100 degrees F., otherwise the risk is too great to operate a plant at a profit. Suppose the plant is already built?

"What Would Be the Remedy?"

The only remedy would be too add some fire clay, if obtainable cheap enough. That would increase the range between vitrification and fusing, according to the quantity used.

I have been asked if a clay that burns hard at 1700 degrees F., when incipient vitrification takes place and vitrifies at about 1850 degrees F. and fuses at 1900, can be glazed. I will say that such clay cannot be salt-glazed with "Safety First." Perhaps only "Christ" may have been able to do it, and then there would be some saying: "He didn't do it."

I have not seen "Villa and his band," killing the Americans in Columbus, N. M., but I believe and you believe that they were there. We believe many things that we don't see; we believe it on the strength of what others tell us. And there you are.

CLAY PRODUCTS CO. INCREASES CAPACITY.

The Clay Products Co., of Brazil, Indiana, which makes a specialty of the manufacture of conduits, is increasing its capacity to cope with the increased demand for its product, and after careful investigation has decided to adopt the Claude Smith Steel Shell Kilns of which they will build eight of a special pattern. The success of the Clay Products Co. is largely due to the use of modern equipment, and the Smith Steel Shell Kilns were adopted for the purpose of economy.

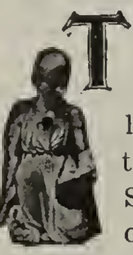
FLORIDA'S BRICK ROADS.

Florida these days is "eating brick." The building of brick roads has been given a strong impetus during the past year by the introduction of new constructional methods which make for durability. In Volusia county recently a contract was let to the Southern Clay Manufacturing Company, of Chattanooga, Tennessee, for 200,000 yards of 3½-inch wire-cut lug brick pavement, in the Deland-Lake Helen district, the brick to be laid on edge on a natural soil foundation and grouted. This road will be about 26 miles long, and 9 feet wide except in Deland. In the latter place the roadway will be paved 50 feet wide. Many miles of this type of road was constructed in Orange county in 1915, and a large amount of yardage will be built in other sections during the current calendar year.

It is easy enough to understand the importance of wages and the difficulties of adjustment now and then which lead to strikes when we consider the fact that two-thirds of the inhabitants of the United States live on the contents of the envelope or salary envelope, which is the same thing under a more polite name.

Written for The Clay-Worker.

BRICK NEWS FROM THE TWIN CITIES AND THE NORTHWEST.



THE BUILDING SEASON has been quite active in these cities for the first quarter of the year, but during the past month, there was something of a let up as compared with previous experiences, although there was a good showing of work right along. Some attribute the slackening to the advanced cost of steel, with cement and other items increasing, as well as to the difficulties which are being encountered to secure deliveries of a number of items. While this has not struck the brick business directly, yet it has its bearing, since the delays from other items will affect many a project involving a great deal of brick.

There have been fewer of the large projects started in the Twin Cities during April than before. On the other hand, there seems to be no end to the number of brick apartment buildings, generally in one, two and three room suites, three to four stories high, and of brick construction. It is undoubtedly true that in the past four months in the Twin Cities there have been started projects of this character which will cost close to 1,000,000 and all in units costing from $20,000 to $50,000 each. A number of rows of such apartments have been built, and more seem to be coming right along. In view of the fact that the individual detached home proposition seems to be as popular as ever, it is something of a wonder whether one or the other character of construction will not prove to be overdone. This has been feared by some for a number of years, but has not proved true so far, so it is well within the possibilities that it will not yet become the case.

S. M. Klarquist & Son, of Minneapolis, received the contract to lay 1,500,000 brick on the new Soo Line elevator now under construction in North Minneapolis.

The Washburn-Crosby Co., of Minneapolis, expects to erect a large grain elevator adjoining its plant in the milling district.

The Albert Dickinson Co., of Minneapolis, will erect a large working grain warehouse in Southeast Minneapolis this spring, to cost $300,000.

Seventy Minnesota architects entered the competition inaugurated by the Minnesota art commission for a brick cottage or residence, suitable for city, town or countryside. It is not to cost in excess of $2,500. The award is to be made May 22. Much interest is felt in this competition, as will be noted by the fact that about one-fourth of all the architects of the state have entered the contest. The Northwestern Clay Association started the movement at its annual convention in January which brought this contest about. It is expected that the accepted prize designs will be given publicity by the art commission along the lines followed by the previous contests, which have been sent out by millions. The others were for wood construction. The clay association made this move in order to present the possibilities of brick construction in small residences. The first prize is $200, the second $175, the third $125, the next three $50 each and six more will be given honorable mention. The purpose of the contest, as stated on behalf of the commission is to show to the people of the state the possibilities and to encourage the construction of fireproof buildings with artistic surroundings. The funds for these prizes were subscribed at the annual banquet of the Northwestern Clay Association, which was attended by only a comparatively few representatives of manufacturers. Notwithstanding this, the suggestion seemed so good that the fund was readily subscribed without difficulty at the evening session, and steps taken to arrange for the competition. These plans are to be distributed broadcast, and great good to the brick trade is expected to follow.

The Minnesota Brick Co., of Minneapolis, has been granted a lease to Columbia street, from Thirty-first to Thirty-third avenues, for trackage service to the proposed new plant. Some of the details regarding the construction of the new plant have not been completed and work has not yet been started on its construction, although the people interested contemplate an early start upon the work.

A test is to be made by the sewer department of the city of Minneapolis of segment block clay tile in sewer construction, to determine whether it is superior for sewer use to ordinary common brick or vitrified hollow pipe sewer, and also to be compared with concrete and reinforced concrete sewer. The test will cover whether the segmental block is cheaper to lay, and if it is more desirable from any and all other standpoints.

Quite a number of extensive private jobs of drainage work with tile on private farms has been installed this spring. One job was awarded in West Union township near Sauk Centre, Minn., to cost $5,000.

T. WIN.

SPECIAL CLAY MARKETS.

Regular readers of the Clay-Worker will easily recall comments in these columns upon the subject of clay values and the developing of clay marketing as a distinct business from clay burning, and now it is interesting to note some special phases of this matter that have been developing lately.

One of these is in connection with the use of domestic clays in paper-making, and the other has to do with the clays as binders in the making of crucibles, abrasive wheels and similar products. Quite recently a conference was held between a number of clay mining companies and the United States Bureau of Standards upon the subject of using domestic clays in the paper industry. It was shown at this conference that several mills in this country were already using American clays with excellent results while other mills making the same grade of paper claim they had never been able to use anything but imported clays.

These facts are taken to indicate that part of the criticism and objection to domestic clays has been largely a matter of prejudice. Some have claimed that the foreign clays have a whiter appearance yet it appears from this conference that imported clays are treated with ultra-marine blue giving them an artificial effect.

The clay concerns interested in taking part in this conference have promised to furnish the Bureau of Standards with all the clay it needs for investigating this matter, and with earnest co-operation between the Bureau of Standards and those interested in developing American clays for paper-making it is thought that we will soon not only be independent in the matter of clays but will find that our domestic clays will serve all needs just as well as the imported.

At the same time there was a conference on the subject of using American clays in the making of graphite crucibles, that is determining just what we have in the way of clays that will serve as bonding material in this work. Clay is used as bonding material also for quite a line of abrasive wheels and other products in this class. So we are steadily developing a number of interesting special markets for clays that will in time constitute an important branch of the clay industry.

TESTS FOR FIRE RESISTING.

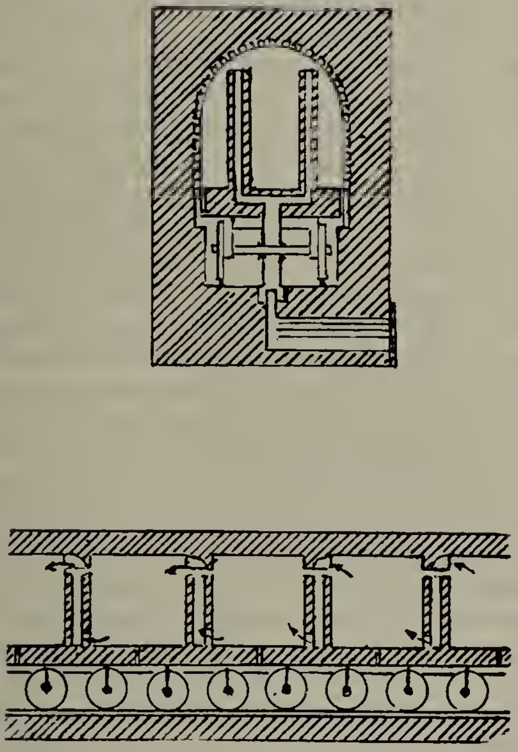
Among other experiments under way the Bureau of Standards is undertaking a series of tests to determine positively the fire resisting qualities of different materials for construction. The idea is to determine the effects of fire upon the full size wall members commonly used in building construction. A panel furnace has been erected and given a workout on a large test panel of fire brick. As soon as this series of tests is completed we will have some specific authentic data on fire resisting qualities of different material, and somehow we feel like this test will prove a boost for brick because brick is pretty well tested by fire in the process of making and is pretty generally regarded as the best fire resisting material for use in building construction.

FOREIGN SCRAPINGS

Clayworking Industries in Norway.—The greatest amount of clayproducts used was, in Frederikstad. 17 million brick, 6½ million roofing tiles, and 1 million sewerpipe which were sold there in 1915. The next city was Bergen with 11 million brick, Christiania followed then with 9 million. The prices are better in the last part of the year than in the first part, and the price at Christiania was from 33-35 Gronen per 1000.

—Tegel No. 3, 1916.

Defects of Tunnel Kiln.—In the various tunnel kilns now in use, it has been found that the air and the material towards the outside of the kiln, are too cold when they come to the firing chamber. The cause of this is found in the fact that there must be left too much room between the material and the chamber inside in order to give free passage. Mr. F. K. Meiser has obtained German patents 277,757 and 278,187, which are designed to overcome this trouble. In the one patent, the air is heated towards the outside, so that the chamber will be uniformly heated, and in the other patent he applies the down draft principle, and in fact each chamber is a small down draft kiln. —Tonind Z. No. 12, 1916.



Tunnel Kiln.

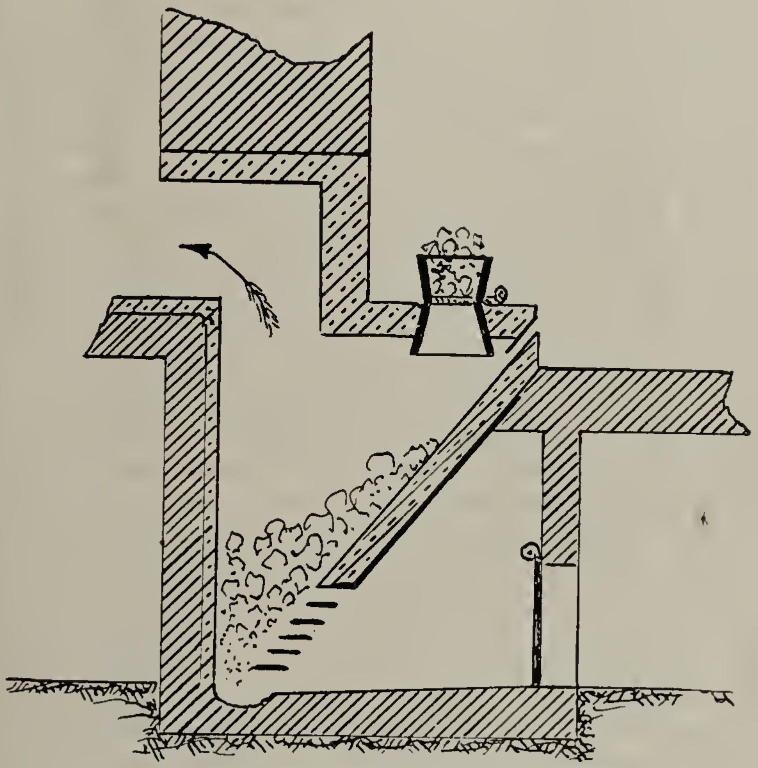
Brick Making in Ecuador.—The industry of making brick and clayproducts in Ecuador is very primitive. For the building of houses, they use by preference socalled "Adobe" which means a sun-dried brick made of clay and straw. The size of these brick is 44x20x12 Centimeter (17½x7½x4¾ inches). For the outside walls of larger buildings a burnt brick is used, which is called "Ladrillos" and measures 40x20x6 centimeter (15¾x7½x2⅜ inches). These brick are burnt in open clamp kilns and very uneven and varied in color. In the same way are roofing tile burnt. Anybody who intends to build, goes out and makes his own brick and burns same, and there are also many small brickyards close to the cities. The price of the abodes brick is 18 Sucres per 1000, about $11.00. Ladrillos cost 34 Sucres ($21.00) per 1000 and roofing tiles are sold for about 20 Sucres ($13.00). In order to improve the conditions, the government has appointed a commision to study the foreign methods of clay manufacturing and will install a small technical department for the benefit of the brickmakers.

—Tonind Z. No. 140, 1915.

Grog and the Term "Fire Resisting".—The general idea among clayworkers is that when grog is used, the material is fire resisting. This is a mistake, for there are quite a number of instances where grog is used in common clay products, and they are not fire clay or fire resisting products. When grog is used for fire clay purposes, it has been found that the nature of this grog becomes better after every firing. The fresh calcined clay is therefore not as good as burnt clay products, which have been fired several times. This explains the fact that in potteries where saggers are used, that the continued use of broken saggers for grog purpose is universally in use, for it has been found that with fresh grog the breakage is far greater than with the use of old grog.

—Tonind Z. No. 10, 1916.

Gas Generator Fire Box.—In the combustion of fuel there are several principles which have to be observed in order to get the full benefit of the fuel gases. In order to carry out these principles, fire boxes are now being designed to act not only as fuel combustion furnaces, but also as gas generators. The illustration shows a fire box, built along the principle of gas generator, of which many advantages are claimed. When the coal on the fire clay slab are gasified, new coal is let in from the top of the hopper above the furnace. All air passes through the heated coal and no cold air is admitted to the furnace. —Revue de Ceramique, No. 6, 1915.



Gas Generator Fire Box.

White Slip for Red Clay.—White slips can be used to advantage for covering red clay. The white slip is mixed as follows: 30 parts of kaolin, 10 parts of ball clay, 40 parts of sand and 20 parts of feldpsar. After the white slip is applied to the red clay ware it is burnt at a temperature between cone 010 and 05a, and after being burnt, any glaze can be applied if desired. It is best to use a fritted glaze for that purpose, and one of the following composition 83.85 parts of feldpsar, 38.20 parts of borax, 15.90 parts of soda, 10 parts of whiting and 61.20 parts of flint. These ingredients are first fritted together, and then ground fine, and to 180 parts of this fritted mixture is added 10½ parts of ball clay and the mixture will be ready for glazing.

Keramische Rundschau No. 48, 1915.

BRICK AND LUMBER OR CO-OPERATION VS. COMPETITION IN BUILDING

An Address by F. H. Chapin, Before the Ohio Association of Retail Lumbermen, Cleveland, February 22, 1916.

I FIND myself the victim of peculiar circumstances in coming before you this morning. When I received a letter from Mr. King asking that we try and arrange for someone to appear and talk to you on this subject, I did not take time to canvass the field for someone in our industry to whom we are in the habit of looking to do this sort of thing, before giving him my promise that someone would be present. I recognized the courtesy extended, and also the importance of the opportunity to promote a closer relationship, if possible, between these two great factors in the building world. I did not hesitate to give my promise when I thought the other fellow was going to do the work, but after getting into communication with our National Association, I was told that they were experiencing difficulty in finding men to fulfill their own promises, and that I had best do it myself. So it will be a "one-man" viewpoint that I shall endeavor to give you, but one in which I feel every important face brick manufacturer will naturally share.

I take it that we all look upon our business as rendering a service to those who need it. Speaking broadly, let me put it this way. The people of Ohio require building materials, and we, as manufacturers and dealers, are rendering the service of supplying them. Competition to render the best service is getting to be the keynote of modern business. A perfectly sane and logical question for this Association and its members to ask themselves is, "Are we actually advising our customers so that they are buying for and getting the buildings that render them the best service?" The men who help the public to get the best buildings, that give the best service and make the best towns will be able to stay on the job and hold their business longest.

The country is awakening to the great burden of unnecessary overhead expense that is being annually put upon them. There is a public economic sense that is at work on many issues of our national wastefulness. One of these is the unnecessary burden involved in the two hundred and fifty million dollar annual fire loss, the one hundred and fifty million dollar cost of fire fighting, and the heavy insurance bill which far exceeds the fire losses that is paid back to fire losers. There is good reason for waking up. We are now thinking a broader way as pertains to our national welfare. We are thinking of national efficiency, national conservation, national waste, and the big, obvious and preventable wastes which I have just mentioned are coming in for first consideration.

It is my purpose to speak only of the waste in buildings that house our industries, and house our people—the factory building and the home. I want you to get in mind one figure, the total value of the homes in the United States. It is about forty-five billion dollars, and is about one-fourth of all our national wealth. If the value of lands were left out, it becomes one-third of all the wealth the labor of our people have created.

I ask this question seriously and impartially, are the wooden exteriors, which are today going onto 80 per cent. of all dwelling houses, the best investment from either an economic or safety standpoint? Do they last as long as they should? Do they require the minimum amount of upkeep cost? Do they create a city that is safe from conflagration? Is the annual cost of painting them an increase of our country's wealth, or is it just a drag on our progress? At the same time, I ask just as seriously, and just as impartially, is not the brick wall for all houses far better, and does it not answer better the real needs of not only the individual house, but also the whole city? I think a substantial answer to and some good homely advice on these questions comes to us from the experience of older countries. Most European countries almost universally build quite permanent fire-resisting and weather-resisting exterior walls. Wood is used freely in the interior, but fires do not wipe out cities except as the torch in this lamentable war has been carried and set in each house. Europe's fire department, to American travelers, seem a joke. They are, but the joke is really on us. Europe is not envious of our fire departments. She is content that that glory should be ours so long as her fire losses are about one-eighth of ours, proportionally, her fire insurance rates are much less and the repair and upkeep are practically negligible on their millions of masonry exterior houses.

I believe in every kind of building material now in use in the United States, and we cannot well do without any one of them, but I believe we can use them more sensibly. There is room for the better combination of these materials so that one protects, supports and beautifies the other in its proper function. It is our business, or we should make it our business to advocate the combination of brick and wood so that the result may be the safest, most enduring, and the most beautiful homes built in the world.

This brings me to a point where I want to touch on the so-called "mill construction" building. Over at the Complete Building Show in the exhibit of the National Lumber Manufacturers' Association, is a model of a large modern factory building, with the brick walls for the exterior and mill interior. This kind of building, when equipped with automatic sprinklers, is one of the safest fire risks known to insurance actuaries. The experience of the Factory Owner's Mutual Insurance Co. in New England proves this. They are mutual insurers of cotton mills, which at one time were refused any insurance from old line companies, and were compelled to organize for mutual protection and are now paying back in dividends in some years as high as 90 per cent. of the premiums they collect. The so-called fireproof building is not nearly as safe without automatic sprinkler protection as this type of mill construction is with sprinklers. The Edison fire proves that. I believe there are many other advantages in the mill construction. The jar of machinery is quickly absorbed by the wood, while monolithic buildings transmit these vibrations, and medical science has attributed to this numerous cases of nervous breakdowns among the workers. On the "mill" floors machinery is more readily moved to be set in new places, and old mill superintendents lay much stress on these points. But on this point I do not expect any argument between us, and I need not dwell upon it further, but I want to view the field from another angle.

You have competition which is trying to eliminate the mill building and you have competition which is threatening to take away from you the business of supplying the homes. Some of this competition has not at all times observed Marquise of Queensbury rules, and have struck below the belt, and in so striking, it has not mattered with them whether they hit a lumber man or a brick man so long as they struck some obstacle in the way of the realization of their own selfish interests. I don't believe this to be good business, even if it were good ethics; and I don't think you have found any of the literature that has been put out by our company to contain the vitrolic expressions that have, I am sorry to say, characterized some of the propaganda being circulated by a few interests posing as conservators of the public safety. We have, and are now advocating the use of brick for the exterior of all buildings, but it must be obvious to you that there is a more potent force behind this nation-wide arising to demand a more general use of non-combustible materials on the exterior of houses than that which could be exerted by the publicity propaganda that has been put forth by the brick, or any other industry. I believe the time is at hand when there is to be a much less lopsided look to the statistics showing the comparative use of brick for house exteriors as against those of some other material; and I also believe that that time is not unwelcome to the lumber dealer who possesses the ability to look a little way ahead in his own business. That time can be materially hastened, and the benefits to everybody more quickly realized, if the brick and the lumber industries will brush aside whatever imaginary obstructions there may be in the way of a closer co-operation.

Now, how are we to bring about this co-operation, and what are to be the advantages of it to each side? This is too big a question for me to assume to offer a complete solution, for it will bear the most concentrated thought of the best minds in both industries, but I will venture one suggestion.

Before doing so, let me call attention to what I, as a brick manufacturer, today consider the most promising, and at the same time the most undeveloped field or opportunity for the extension of our market. That is the 89 or 90 per cent. of residence buildings which are today being faced with lumber or stucco. It is the Henry Ford market that lies at the doors of the brick industry, but there have been, and still are, obstacles in the path of its speedy development. The greatest of these difficulties lies in the carpenter-contractor-architect operating in the small communities. He is a necessary institution, and there is every reason for maintaining his existence, but he needs making over to a certain extent. In most every case he has grown up in an atmosphere of lumber; he has learned his trade from others who have been inseparably identified with a lumber environment; that is the material he knows most about, the only one he knows much about, and is his most natural recommendation when his advice is sought.

Now let us scan the process through which this carpenter-contractor exerts a powerful influence against the brick-faced house in the small cities. There is no animosity in his attitude, it is just a natural, human position for him to take. Bill Jones and his wife, living in Hicksville, have decided that they would like to build a house—it may be for a home, or it may be for an investment. There is no local architect in Hicksville, and if there was, it is only one chance in ten that Jones would go to him—that's about the percentage of residences upon which regular architects are employed—but for many evenings he and Mrs. Jones have sat at their library table and devised and revised, and drawn and redrawn preliminary plans of that house, and they have boiled down a floor plan that represents to them the acme of convenient and desirable arrangement. Then with considerable pride in their achievement, he goes to his personal friend, Hank Smith, who is the carpenter-contractor and general handy-man of the town, and lays before him his drawings. He's got a lot of confidence in Smith because "Hank" built a cow-stable for his father some years ago and has done most of the repair work around town ever since he can remember. Smith looks over the plan very carefully—it's a pretty good plan, but, of course, not being correctly drawn to scale, will have to be changed in some respects to make it practicable. Then he goes to a box and digs up a bunch of plans which have been generously furnished him by the lumber interests. They are all nicely drawn, and dimensions indicated, and, of course, call for wood construction throughout. Running through them, he finds one that somewhat resembles that which Jones has drawn up, and spreading it out, he shows how, with a slight alteration here and there, it can be very nicely adapted to the present requirements.

If Jones has not taken the trouble to investigate the various kinds of construction, he, of course, has no other ideas, and it doesn't take them long to come to an agreement. But, suppose some of the brick manufacturers' advertising has found its way to Jones and he has been impressed with the argument in favor of a brick house, and he says to Smith: "I've been reading a good deal about brick houses lately, and I believe we would like to use that material if possible. What do you think of it?" "Oh, my! We can't think about that," says Smith, "First of all, it will cost you in the neighborhood of thirty per cent. more for this same size house; the bricks will all have to be shipped in, and then we haven't anyone here who can lay face brick very well, and we would have to send out of town for masons, which is expensive because you would have to pay their railroad fare both ways and possibly board them besides, and then after all, your house is likely to be damp and unhealthy to live in," and before he gets through, he has knocked the everlasting daylights out of that perfectly good idea that Jones had sprouted, and which cost the brick interests a lot of money to plant. .

Now it hasn't been a pernicious intent that has actuated Smith; he is simply doing the human thing of traveling the line of least resistance. He is not as familiar with brick construction as he is of frame. It would be a little more bother for him to carry the job through if it involved brick construction than it would lumber, because there is no one there to figure his quantities for him the way you gentlemen figure his lumber bills, and then he has no plan to start with anyway, and he can think of a dozen different reasons why he would rather not use brick in that house, and so the usual result—it goes frame.

The question confronting the face brick manufacturer is, can that condition be changed, and if so, what is the logical method of procedure? Can the carpenter-contractor be induced to change his attitude toward brick construction for building exteriors, or must he be supplanted. In my opinion he can be changed readily enough through the influence of the lumber dealer whom we recognize as his supporting ally. The lumber dealer cannot be expected to exert this influence if it means that he is called upon to make a sacrifice of his pecuniary profit. We don't hold it against the lumber dealer that this condition exists. He is only doing the thing which is most natural when he fosters the system through which he realizes a business profit.

Now you will gather that what I have in mind is, that these plans of houses which today are so generously distributed to the carpenter-contractor through sources controlled by the lumber interests, instead of being scrupulously devoted to lumber, be made to embrace brick, at least for the exterior veneering, and I can hear you ask, "In what way is that program going to inure to the benefit of the lumber dealer, because you fellows always go in and sell direct to the contractor, or even the owner, without regard for us." That is true today and the fact is only the natural fruit growing out of a marketing condition, but cannot we take a far-sighted view of the situation and look a sufficient distance into the future to see that, if this comparative ratio of brick and frame dwellings were reversed, and that anything like 85 per cent. of dwellings were to use brick for exterior facing, that it would be just as essential and just as desirable for the brick manufacturer to market his product through a dealer, as it is now for the lumber manufacturer to do so. That if the volume of face brick usage could be developed in these communities to the proportions that is now enjoyed by wood siding and paint, every lumber dealer would find it necessary to carry a stock in his sheds, and be equipped to supply all the accessories of the trade, and that the brick manufacturer would find him a very convenient if not an indispensable channel through which to market his product. Then it would no longer be difficult for the contractor to carry on the brick jobs, for he could be supplied with plans if we were co-operating. He would have your service behind him the same as he has it today. It is not necessary that, because you gentlemen take the designation "Lumber Dealer" that you are debarred, and perpetually restrained from associating yourselves with face brick and kindred materials; on the other hand, you are the logical channel through which all kinds of building material should flow to the consumer. In England one seldom sees the trade name "Lumber Dealer;" it is always "Builders' Supplies," and the firm or individual is equipped to intelligently and promptly handle all the staples of the trade, and I look forward to a time when we will be sending our salesmen around to get your stock brick orders the same as the lumber salesmen now call upon you, and that our service department will be behind you for co-operation on special work, special sizes, ornamental shapes, and so forth, the same as you now look to the mill people to supply you in that department. Personally, I would much rather compete for your business than I would that of the general public, for then the question of service, of fidelity to a fixed standard of policies and square dealing would mean a whole lot more in our business than it does today, because we would have a fixed and steady patronage, where today it is spasmodic, and our patrons widely scattered and only infrequently in the market. The saving that could be effected in the selling expense of brick would in itself represent a very considerable profit.

Now as a suggestion for starting something along the line of this idea, while I have no authority to speak for the Ohio Face Brick Manufacturers' Association, I believe I am entirely safe in saying that a special committee from that organization would be very glad, indeed, to meet with a similar committee from your association for the purpose of working out the details, and putting into effect some program looking toward the accomplishment of what I have suggested. I believe that the proposition is great enough to seriously engage the attention of the National Association of each industry, and it would be eminently fitting that your state organization should start it, and then if you think best recommend a discussion to be put upon the docket of your next National Association meeting.

CORRESPONDENCE

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Believes in Preparedness.

Editor The Clay-Worker:

Enclosed find check covering invoice for the Drain Your Farm Signs.

Should business continue as it has for the last month, we will not have to put up many signs, as we are working to capacity, and orders booked ahead for some time to come.

However, they say when you are busiest is the time to advertise, so we will try it.

We might say that this is the first good year for the sale of drain tile we have had in this part of the state for five years on account of extreme dry weather for that period.

Yours respectfully,
THE RICHLAND TILE CO.,
W. S. Elton, Sales Mgr.

Problem in Salt Glazing.

Editor The Clay-Worker:

In salt glazing our silo blocks, we find it quite objectionable that the ends of the webs also contain a very glassy surface. This is very detrimental in that it is hard to get the mortar to adhere and make a good bond. Now we are wondering whether in the range of your experience you could not offer some methods in helping us to overcome this. We have dipped the ends in the ordinary river sand, but find that most of this drops off before they come through the kiln. We surely would appreciate any suggestions you could make in this regard.

AMERICAN SILO & MATERIAL CO.

Would suggest that the silo blocks be wadded like sewer pipe, or put them on stilts properly shaped like are used in setting chinaware.—Editor.

A Suggestion for Silo Block Manufacturers.

Editor The Clay-Worker:

In reply to the inquiry from the American Silo & Material Co. I do not know of any way of preventing a salt glaze from attacking all exposed surfaces of the ware. Salt glaze does not attack scum readily and the ends might be dipped in a thin paste of gypsum which would not take the glaze but would result in white coated ends. The gypsum would be better than the sand in that it could be made to stick. There is the danger that the gypsum might be reduced and act as a flux at about Cone 3 and if the blocks are made of fire clay this temperature would be reached and the gypsum would act as a flux, hardening the ends and followed by salt glazing.

It occurs to me that if they can afford to dip both ends in sand, why not dip the face in a slip glaze and not use the salt at all. This would entirely overcome the difficulty. I did not suppose there was sufficient margin of profit in the product to stand the handling required to dip the stuff.

Yours truly, ELLIS LOVEJOY.

Thoughts Of An Absentee.

Dear Mr. Secretary:

I enjoyed reading the full report of the Cleveland convention. I had planned to be there, but at the last minute found I could not get away, much to my regret. My one consolation was reading the full report in the March Clay-Worker and the banquet proceedings in the April number. Evidently, as had been expected, you had one of the best conventions in the history of the association and fully justified the wisdom of the Executive Committee in choosing Cleveland.

I also enjoy the sessions of the American Ceramic Society and think it is advantageous to have the meetings of both organizations at the same time and place. Sincerely hope you can arrange for a meeting of both associations at some convenient point next year. It is quite advantageous to have Professor Orton with us for we never call upon him for information in vain. Long may he live and prosper and continue an active member of our society.

Congratulating you and the other officers of the association on the success of the Cleveland convention and hoping to be with you at the next convention whenever and wherever it may be held, I am,

Yours very truly,
Shawmut, Pa., May 10, 1916. ALFRED YATES.

Pulverizer Company Opens Pittsburgh Office.

Editor The Clay-Worker:

The American Ring Pulverizer has won a reputation of "Power to produce results," and the constantly increasing demand for same throughout the Eastern States, has prompted the company to appoint the writer, formerly secretary of the company, as eastern sales manager, who will have full charge of territory, including the states of Indiana, Ohio, Pennsylvania, West Virginia, Maryland, New Jersey, New York and New England. The establishment of an eastern sales headquarters at 207 Fulton building, Pittsburgh, Pa., has been made with a view of better serving eastern patrons—to bring an expert representative in closer contact with the trades requiring pulverizing machinery—where prompt attention can be given to all inquiries, and to make it possible for a direct representative to visit all who may desire his personal call.

Yours very truly,
GEO. C. VIDETTO,
Pittsburgh, Pa. American Pulverizer Co.

Iowa Clayworker Suggests Standardizing Fireproof Construction.

Editor The Clay-Worker:

In getting into the questions of insurance and fire prevention for moderate sized buildings, I think anyone would be impressed with the absence or at least scarcity of standardized methods of testing economical fire-safe construction for residences.

The attention seems all to have been given to large buildings, where 1,700 degrees, maintained for four hours, followed by water, is the requirement. Of course, it is much more severe than is necessary for residences preventing economical construction in this type of building from being recognized as fireproof.

I have talked this matter over with several prominent engineers and there seems to be no reason why we cannot as safely assume the amount of combustible material that will be found in residences as we can assume the floor load.

This proposed method of testing should be considered simply as a suggestion or basis upon which to perfect the idea. I believe it will be a big step in advance if a logical standard method of building and testing can be established.

We are going to do some work along this line, this season in Iowa. We hope this will benefit all brick and tile manufacturers and that you and your readers will co-operate with us by criticising and making suggestions upon this plan.

Proposed Standard Test for Fireproof Residence Construction

The central idea of this proposed test is to subject the structure to more trying conditions than it would be at all likely to be subjected to in case of accidental fire. Then sufficiently rigid test of the structure shall be made to demonstrate beyond all doubt the fitness of the building for continued occupancy. The latter proposed test shall be based upon factors of safety ordinarily used in the design and testing of such structures.

Any or all portions of the test structure may embody the type of construction to be tested, however, in order to test a floor construction it must serve as a ceiling in the test structure.

The horizontal dimensions of the test structure shall be between 14 and 20 feet, and the height shall be between 7 and 10 feet, conforming to usual practice in the class of buildings being tested.

The test structure is to be subjected to the heat of combustion of a quantity of wood equal to more than the largest amount of rapid burning material usually found in residence rooms of the size and type being tested. As a preliminary assumption, 7 pounds of combustible material per square foot of floor area of the test structure is proposed.

The walls of the test structure shall contain one or two doors and one or two windows, one door and one sash of one window shall be open during the test.

The structure to be tested shall be designed to carry a working load of 50 pounds per square foot and no more. This load shall be distributed so as to furnish a uniform pressure over the entire area and shall be carried while the structure is being tested. At any time during the latter part of the combustion of this material, at the discretion of the engineer in charge, a stream of water shall be directed against the ceiling, then all other parts of the structure in turn. This stream shall be from a 1⅛ nozzle delivered under a 60-pound nozzle pressure for at least ten minutes.

When the structure is sufficiently cooled the load on the floor shall be increased to 200 pounds per square foot uniformly distributed.

The test shall not be considered as successful unless the following conditions are met: No fire or smoke shall pass through any of the walls of the test structure during the test.

M. L. KING,
Secretary Permanent Building Society.

New Haven, Conn., Brick Men Busy.

Editor The Clay-Worker:

The brickyards at Berlin, Conn., are all running full capacity.

With many changes, the steam whistle is no longer heard; the electric motors having driven the steam engines off their own foundations. Of the twenty-seven brick machines, there are but about four that are run by steam.

Another change: The friction winding machine is fast taking the place of the horse and cart for hauling clay to the machine.

The Thew automatic electric shovel is in operation in several yards.

John W. Hahnes, The Donnelly Brick Co. and John Carbo, each are installing the Anderson brick carrier system. All the brickmakers are trying to cut out the labor as fast as possible, for labor is at a premium. Never have I known such a demand for outdoor labor.

The Stiles & Reynolds Brick Company are laying a track to the clay bank, and have purchased a gasoline engine that will take the place of ten horses and carts.

Clark & Son are hauling their clay at East Berlin with a gasoline engine.

I never saw the machinery and yards in such fine condition as they are this spring. Each yard started with an empty shed this spring and a big demand for this year's output. The scarcity of labor is the worst thing the brickmakers have to contend with.

The many friends of Mr. Joseph Tower, who has been very ill, will be pleased to know that he has improved so much that he takes a short ride in his auto each good day.

NUTMEG.

ANOTHER BLOW TO THE WOOD SHINGLE.

An Ordinance—To regulate the construction and repairing of roofs in the City of Montgomery, Alabama.

Be it ordained by the Board of Commissioners of the City of Montgomery, as follows:

That no building or part of any building or structure in the city limits of Montgomery shall, after the first day of March, 1916, be covered or repaired with wooden shingles; provided, that if any roof is deteriorated or damaged not more than 25 per cent., such damaged or deteriorated portion of said roof may be repaired with the same kind of roofing as the undamaged or undeteriorated part. No wooden shingles shall be placed on any roof of any building or structure within the corporated limits of the city of Montgomery, without obtaining first a permit for same from the City Building Inspector, which shall specify the repairs to be allowed.

Adopted February 2, 1916.

Attest: E. J. DEVINNEY,
Clerk of the City of Montgomery, Alabama.

BOSTON HIGH-BROWS HAVE EYE-BROWS SINGED.

Boston people are supposed to be "high-browed" but if indications can be accurately estimated their brows will now go higher. Not long ago an investigation was made in Philadelphia, the slow going Quaker City, to ascertain just how Philadelphia stood in comparison to Boston in a constructional way. The object of the investigation was to ascertain just how far Boston had surpassed Philadelphia in making the city proof against fire. Boston and her suburbs has had considerable experience with fire and as experience is acknowledged to be a dear teacher it was supposed that Boston would have made herself just as safe for the future as it would be possible so to do.

First, the population of the two cities was compared. Boston 687,812; Philadelphia 1,574,000.

Next the fire loss was compared. Boston $2,500,000; Philadelphia $2,172,000.

And right there the brows of Boston went up. Boston with a little over a third the population burned up in a year a third of a million more than Philadelphia. The Boston fire loss per capita was $3.81 and that of Philadelphia was $1.45.

Boston had often acted chestily toward Philadelphia on account of Boston's great fire department and when the extravagance of Boston in burning up so much property each year became known the Philadelphians thought they saw why Boston had to have such a superior fire department and so the Philadelphia investigators turned up the record of expense of the two cities for fire fighting and here is what they found:

To fight fires in Boston cost each year $1,496,631. In Philadelphia it cost $1,341,220.

In other words, Boston with about one-third the population burned up $300,000 more property and paid for fire fighting $100,000 more than Philadelphia.

To fight fires cost Boston $2.17 for each inhabitant and Philadelphia 90c.

And then the committee looked for a reason and this is what it found:

Building regulations of Philadelphia are very strict; and the buildings are chiefly of brick. In Boston frame dwellings predominate.

The investigators of the Philadelphians has not resulted in Philadelphia throwing down the bars and allowing all sorts of buildings to be constructed. Philadelphia sees the advantage of saving on fire fighting, saving on insurance rates and upkeep cost of buildings to say nothing of having a permanent type of buildings which retain their value and enhance value of realty holdings.

Boston, however, has raised her eyebrows a bit more and is coming around gradually to the Philadelphia idea of looking more carefully after building construction.

Boston has just completed a bit of investigating on her own account and she finds the Philadelphia figures correct. She also finds that frame dwellings cost within a fraction as much as brick. Also that frame dwellings depreciate 2½ to 5 per cent. a year, this ratio rather increasing from year to year. Brick residences depreciate only one per cent. a year so that as an investment it requires only a year or two until the frame residence loses the owner money in an increasing and alarming proportion while brick is permanently a better investment.

And so the Boston eye-brows are going higher and higher as their investigation goes on and they are wondering right now if it isn't wiser to build for permanent value rather than to build to burn and to repair. Their annual bon fire bill seems pretty high, even for Boston and when they figure in the high cost of fire fighting made necessary by fire frequency the average Bostonian has concluded that their pride for their fire department is costing a good deal. It wouldn't surprise Philadelphia a bit to see Boston stop "swatting the fly" and giving more attention to "fighting the fire folly" with fire prevention on the grounds that it's better to prevent fires in advance rather than build to promote fires and then pay royally to subdue them.—American Clay Magazine.

A STANDARD PRICE LIST FOR FACE BRICK.

Established Under the "Open Price System"—That Is, One Price To All.

UNDER THE ABOVE caption, Fiske & Co., of New York, has issued a leaflet, copyrighted, giving a description of each of their brands of face brick and quoting a price at which it is offered on the market, an open fixed price to every customer. Messrs. Fiske & Co. have contemplated action of this sort for some time past, believing that market conditions are such that as a "safety first" measure, an open price is essential to success. They believe that the face brick business needs to be standardized, and that all manufacturers and dealers should adopt a uniform method of doing business and a more uniform as well as a higher price.

At present, we quote from their announcement, each dealer has a different way of doing business, and prices are made without any intelligent knowledge of those of his competitors. In nearly every instance he has no fixed price, but "gets what he can." As a result of this confusion and lack of system, the purchaser in many cases fixes the price and the dealer "gets what he can," and is subject to all kinds of abuse at the hands of unscrupulous purchasers.

They believe that a system of standard price lists would do much to remedy the evil and recommend that each manufacturer or dealer publish such a price list and adhere to it strictly.

It is an innovation in the trade and one that everyone connected with the trade may well consider carefully and prayerfully. A copy of the leaflet, which contains a great deal of valuable information, may be had on application to Fiske & Co., Inc., Arena building, 40 West Thirty-second street, New York City.

The manufacture of porcelain doll heads is one of the new clayworking industries established here since the war in Europe. In times gone by we have imported more than a million dollars worth of dolls and doll heads a year.

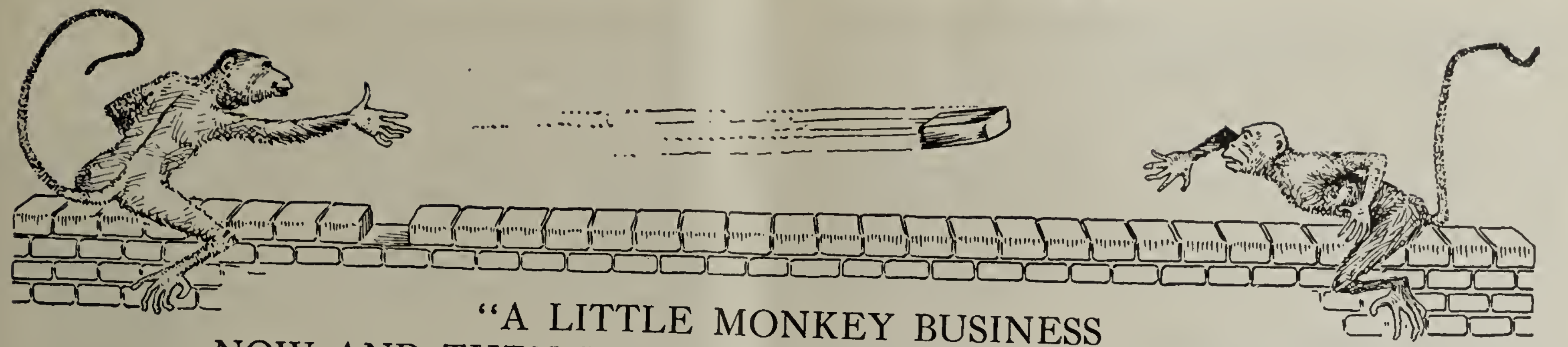
MATHEWS BRICK CONVEYOR IN DEMAND, AND PROVES AN EFFECTIVE MEANS OF OVERCOMING SCARCITY OF LABOR.

The old reliable Mathews brick conveyor is forging ahead steadily and can now almost be considered as standard equipment in brick plants. In spite of the fact that its usefulness has been demonstrated in hundreds of plants, there are still some skeptics who insist upon being shown. Many trial installations have been made to convince the doubting Thomases, with the result—the acceptance of the equipment.

This information is gleaned from a recent communication from the Mathews Gravity Carrier Company, in which they also say: "We now take the position that if a brick manufacturer is not inclined to investigate our conveyor for himself, he is not a very progressive business man. A good many of our inquiries speak of the fact that it is almost impossible to secure competent labor, especially wheelers. We believe our conveyor this season will demonstrate beyond question that it the only solution of the labor problem."

As the proof of the pudding is in the eating, so the proof of the excellence of the Mathews brick conveyor is in the using. During the past year, the following companies have installed this system:

Rochester Sand & Brick Co., Rochester, Mich.; Barkwill Brick Co., Cleveland, Ohio; Glenwood Brick Co., Erie, Pa.; Cleveland Brick & Clay Co., Newburgh, Ohio; Wadsworth Brick & Tile Co., Wadsworth, Ohio; New York Clay Products Co., Van Deventers, N. J.; Iowa Stone Co., Cedar Rapids, Iowa; Windsor Brick Co., Winchester, Mass.; Anders Shale Brick Co., Cincinnati, Ohio; Harris Brick Co., Zanesville, Ohio; Boston Berkshire Brick Co., Medford Junction, Mass.; Sheridan Press Brick Co., Sheridan, Wyo.; Belt Line Brick Co., Minneapolis, Minn.; Edwards Brick Co., Columbia, Mo.; Parkersburg Shale Brick Works, Parkersburg, W. Va.; Holton Brick Co., Holton, Mich.; Buckeye Builders Supply Co., Toledo, Ohio; Indianola Brick & Tile Co., Indianola, Miss.; Morey Clay Products Co., Detroit, Mich.; Palmer Pressed Brick Co., Palmer, Texas; California Brick Co., Niles, Cal.; Saginaw Brick Co., Saginaw, Mich.; E. J. Woodison Co., Detroit, Mich.; Keller Brick Co., Cuyahoga Falls, Ohio; Tempest Brick Co., McKeesport, Pa.; Tuttle Brick Co., Middletown, Conn.; Globe Press Brick Co., Ferris, Texas; Bloomfield Brick Co., Bloomfield, Ind.; Seguin Brick & Tile Co., Dallas, Texas; Kingsport Brick Corporation, Kingsport, Tenn.; Clark Pressed Brick Co., Malvery, Ark.; Trent Brick Co., Trenton, N. J.; Wilson Brick & Tile Co., Pittsburg, Pa.; Diamond Press Brick Co., Ferris, Texas; Gloninger Brick Co., Pittsburg, Pa.; F. J. Guard Clay Products Co., Wilkes-Barre, Pa.; Harbison-Walker Refractories Co., Harwalk, Ohio; Acme Shale Brick Co., Buffalo, N. Y.; Advance Fire Clay Co., Uhrichsville, Ohio; Taggart & Brown Co., Springfield, Ohio; Worth Bros. Co., Coatesville, Pa.; Frontier Brick Works, Niagara Falls, N. Y.; Hope Brick Works, Hope, Ark.; Ajax Brick Co., Detroit, Mich.; Newburgh Brick & Clay Co., Willow, Ohio; Metropolitan Paving Brick Co., Canton, Ohio; Denver Pressed Brick Co., Denver, Col.; Ringle Brick Co., Ringle, Wis.; Whiteland Silica Co., Exton, Pa.; Cuyahoga Brick & Shale Co., S. Brooklyn, Ohio; Ohio Clay Products Co., Salineville, Ohio; Ferris Press Brick Co., Ferris, Texas; Riverside Brick Co., Charlotte, N. C.; Cobb Brick Co., Ft. Worth, Texas; Athens Brick & Tile Co., Athens, Wis.; Carlisle Brick & Tile Co., Carlisle, Iowa; St. Joseph Pressed Brick Co., St. Joseph, Mo.; Central Clay Products Co., N. Tonawanda, N. Y.; Vanport Brick Co., Vanport, Pa.; Sioux City Brick & Tile Co., Sioux City, Iowa; Standard Brick Co., Palmer, Texas; Kansas Buff Brick & Mfg. Co., Buffville, Kan.; Fulcher Brick Co., Nashville, Tenn.; LaCledc-Christy Clay Products Co., St. Louis, Mo.; Grande Brick Co., Grand Rapids, Mich.; Darlington Clay Products Co., Darlington, Pa.; Louisville Clay Products Co., Louisville, Ohio; Delta Brick & Tile Co., Grand Rapids, Mich.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Reproof.

"Who was Shylock, Aunt Ethel?"

"My dear! And you go to Sunday school and don't know that?"

Historically Correct.

A little girl when asked to define the human and animal families, replied, "A brute is an imperfect beat; man is a perfect beast."—"The Lookout."

Only a "Ring-Off."

"Auntie, did you ever get a proposal?"

"Once dear. A gentleman asked me to marry him over the telephone, but he had the wrong number."

Testing Father.

Willie—Do you know everything, Pa?

Pa—Yes, my son.

Willie—What is the difference between a son of a gun and a pop of a pistol?

Willful.

"I understand that you have a new motor car."

"Yes."

"Do you drive it yourself?"

"Nobody drives it. We coax it."

Proving It.

First Mother—Mrs. Clancy, yer child is badly spoiled.

Second Mother—Gwan wid yes.

First Mother—Well, if you don't believe it, come and see what the steam roller did to it.

Hardly.

"A scientific sharp says that young couples in the future will pat one another on the hand. Says the pat-pat must succeed the kiss."

"Can you imagine a young man spending two hours begging for a pat-pat?"—"Kansas City Journal."

One for the Girl.

"Girls make me tired," said the fresh young man. "They're always going to some of these palmists to have their hands read."

"Indeed!" said she sweetly. "Is that any worse than men going into saloons to get their noses red?"—Exchange.

Tears, Idle Tears.

It was at Mount Vernon. The guide noticed a woman weeping, and said: "Pardon me, madam, but you seem to be in distress. Can I help you in any way?"

"Oh," said the woman, "I am in no trouble. I have always felt that I should be unable to keep back my tears when standing by the tomb of Washington."

"Well," replied the guide, "there is no need to weep here; this is the ice house!"

Going Into Detail.

Attorney—And you say you saw Mrs. O'Leary milking the cow?

Witness—Yes, sir.

Attorney—Well, where did you see Mrs. O'Leary milking the cow?

Witness—I should guess just about the center, your Honor.

Not a Thorough Job.

"Come, all yo', and be baptized," cried the chocolate evangelist.

"But Ah've been baptized by the Presbyterians," said Rastus.

"Lo'd," cried the Baptist minister, "yo' only been dry cleaned."

The Best Is Yet to Be.

Arthur—Why is it, fairest Evangeline, that when I am with you the hands on that clock seem to take wings and fly?

Stern Voice (at the head of the stairs)—Without wishin' to be impertinent, young man, I simply want to observe that them hands hain't got nothin' on the ones on our gas meter.—"Judge."

The Peacemaker.

Fond Mother—And has mamma's angel been a peacemaker today?

Mamma's Angel—Yes, Ma; Tommy Tuff was a-lickin' Willie Whimpers, an' when I told him to stop he wouldn't, an' I jumped in an' licked the stuffin' out o' both of 'em.—"Purple Crow."

Explained.

Eminent Woman Surgeon, Who Is Also an Ardent Suffragette (to wounded guardsman)—Do you know, your face is singularly familiar to me? I've been trying to remember where we've met before.

Guardsman—Well, mum, bygones be bygones; I was a police constable.

Due Caution.

"Bobby," inquired the mother, "did you wash your face before the music teacher came?"

"Yes'm."

"And your hands?"

"And your ears?"

"Well, Ma," said Bobby, judicially, "I washed the one that would be next to her."

Out of All Reason.

"That new family next door borrowed our lawn mower again this morning," his wife told Jones.

"Well, why did you lend it to them?" he complained.

"How could I help it?"

"You might have given them some kind of an excuse."

Mrs. Jones waxed sarcastic.

"Yes," she snapped. "I might have told them that you were going to use it—or some other crazy, impossible thing."

COMPLETE BUILDING SHOW A GREAT SUCCESS

THE SUCCESS of the Complete Building Show at Cleveland was so marked and the benefits derived by the exhibitors and the building public was so apparent that the Cleveland promoters are now considering the holding of a similar Complete Building Show in the Grand Central Palace in New York City the coming winter. It is anticipated that, profiting by the experience of the first show, that a larger and more effective exhibition, one that will be of immense benefit to the manufacturers and dealers of incombustible building materials, can be pulled off at the metropolis.

The Merchants' Association of New York, a live organization of nearly 5,000 of the representative business men of that great city, through its convention committee, has interested itself in the project, and a movement is on foot to secure, during the show week, conventions of the leading building trades. The National Brick Manufacturers' Association, the American Ceramic Society, the National Paving Brick Manufacturers' Association and other kindred organizations, will be invited to meet there in March next. It is urged that the greatest city in the world is the logical place for such an exposition of permanent building materials, and, with seeming reason, it is predicted that a much larger attendance can be counted on than has ever occurred before.

Future shows under the name of the Complete Building Show will be of the same type as the Cleveland exposition. The stamp of approval given that enterprise by both the trade and the public, establishes it as the best trade stimulating event ever attempted by manufacturers of building materials.

The show of future years will be open to all materials and effort will be made to group the various industries and produce large community exhibits of educational nature rather than a great number of individual exhibits. It was this last feature that made the Cleveland show stand out strongly in comparison with previous efforts.

More pretentious displays are possible in Grand Central Palace than were attempted in Cleveland. The Palace is the most modern and one of the most beautiful exposition buildings in the country. With ample height on its main floor, it will be possible to erect full scale buildings and there is planned a novel feature calling for a completed residence that will be the chief attraction of the New York show.

That the Complete Building Show will be taken up by other cities, following the New York exposition, is certain. St. Louis already is considering the project. Buffalo, Pittsburgh and Chicago are interested in having a show of this nature. In each city, local enterprise will be back of the exposition, but the Cleveland plan will be followed.

Not only was the first Complete Building Show a success from the standpoint of boosting business for its exhibitors, but it was a financial success. The Cleveland concerns promoting the show did not go into the enterprise for profit. They hoped only to get their money back and proposed to disburse all profits to the exhibitors themselves. After returning the amounts paid for the stock of the company, with a ten per cent. dividend, the company will be able to pay a substantial return to the exhibitors. The amount of this rebate will be between fifteen and twenty per cent. of the amount each paid for space in the show.

In results to the exhibitors the show is a surprise to the most enthusiastic supporters. There has been a flood of inquiries since the show and those who exhibited their materials are reaping a harvest.

About fifty per cent. of the exhibitors in the first show have made application for space in the second Cleveland exposition, whenever it may be held. The management expects that Cleveland will have a new exposition hall within two years and has applied for the first rental of the proposed building. It is not probable that a second show will be held in the home city of the enterprise until such building is completed. The Coliseum was crowded for the first show and practically every applicant for a future show has asked for larger space. The old building would not take care of those who were in the initial show and there are scores of companies who failed to take advantage of that exposition who are already on record as wanting space the next time.

Many of the companies applying for space are distributers over a wide territory and will be exhibitors in New York and other cities in which the Complete Building Show is held.

A BUCKEYE.

OBITUARY

Death of Andrew Harrington, Galesburg, Ill.

Again the final summons has come to an old-time member of the N. B. M. A. Andrew Harrington, secretary-treasurer of the Frost Manufacturing Co., Galesburg, Ill., died May 4, at his home after but a few days serious illness. However, he had not been in robust health for a number of years. Early in the history of the N. B. M. A., he was conspicuous at many of the conventions, and by his genial, kindly disposition, won a warm place in the hearts of all who knew him. He was a man of exceptional business ability and was prominently identified with the commercial interests of Galesburg, where he was born August 20, 1866. It was largely through his influence and energy that the modern plant of the firm with which he was identified throughout his business career was built and equipped and it stands as a monument to his ability and enterprise. Mr. Harrington was a member of the Masonic fraternity, the Order of Elks and the Galesburg Club, of which, at one time, he was president. Three children and Mrs. Harrington survive him.

Andrew Harrington, Galesburg, Ill.

While you are at the job of boosting brick for building operations make the work thorough by talking brick for foundations as well as for the upper walls.

QUESTIONS OF INTEREST TO CLAYWORKERS

Washing of Clays.

THE ARTICLE headed "The Problem of Pottery Clays," in the February Clay-Worker, is before me and the optimistic view shown therein is sure to be admired. The present European war has thrown some of the clayworking industries out of their old balance, and has put the manufacturer of certain refractory products on his mettle, in that he must resort to replacing the imported materials, in whole or in part, by domestic products. That these replacements have been done successfully in other lines, augurs well for the possible accomplishment in the clayworking industries.

That there are clays in the United States which, when properly manipulated will entirely supplant the imported lines, is reasonably sure, but some of these refining and purifying processes are still a question of development, in a great many cases, when the clay producer takes into consideration that the European clay-washing or refining establishments have been in existence for a long time and thus have gathered a multitude of experiences, the clay man cannot reasonably expect to jump right in and produce the very best product at the outset.

Take a clay-washing plant in St. Louis for instance, which has a gilt-edge reputation for their finished refractory product. These people run their factory very systematically upon refining lines which have taken them years to develop, yet when passing through their establishment everything runs like clock work and one sees no trace of secret processes. When their product was first put on the market they had a time to induce the manufacturer to try out their clays, properly, intelligently and honestly. One of the troubles in establishing new clay washing plants consists in not taking cognizance of difference between the older or exposed clay and the newly mined clay. The older or longer exposed (croppy) clay has been subject to the influences of the various weather conditions for a longer or shorter time, and thus developed physical conditions which are not present in the main body clay. This is one reason why some times clays, even from the same location, differ in their so-called workability. By this is meant plasticity. Clay works often resort to artificial aging of clays, but the action of time and its attendant influences are very difficult to reproduce with a short-time factor.

However, a great deal can be done by attentive manipulation. For instance, Mr. A. had clay piled out for two or three years to weather, yet the clay was not even half-way disintegrated. It was also noticed that the clay was always drier where disintegration was very limited. Absence of water was assumed to be the detrimental cause. The damper clay was weighed, the amount of moisture thus determined and, for experimental purposes, such amount of water was added to the fresh clay as it was put on the dump, and it was proven by the action of such additional water and attendant freezing weather, such prepared clay, after washing, was just as serviceable as the croppy clay, where the plasticity has been developed by Dame Nature.

In another factory it was impossible to get any more plastic clay, only hard mine clay. After trying various experiments the following successful remedy was applied: To each ton of clay as it arrived in box cars ten gallons of boiling hot water was poured over the clay and the door closed as tight as possible, and through the influence of the hot water and attendant heat this clay was put into good plastic shape so that it could be used, whereas the raw clay, no matter how finely ground, would not work satisfactorily. This treatment was eminently satisfactory in that the clay could be used when it had cooled down to normal temperature.

At another plant the clay began running bad and this hot water treatment was applied, but was not satisfactory. However, when the clay had been treated with about the same amount of live steam, after being ground and then placed in concrete bins, it was found to work satisfactory after being cool enough.

These two instances are cited to show that possibly the same treatment may not be serviceable for all kinds of clays, but it does show that varied treatments may be of service for various kinds of clays, and is probably a happy-go-lucky-way of trying things.

It was pounded into my head in my younger days by my old professor that the man who tries things is the man who finds out things. What he meant was this, the highly trained chemical-technical man is too apt to figure out what the probable results will be, and these obtained results oftentimes influence his future view of the proposed problem, whereas the layman says, I am going to try this and see what comes of it. And the turn is made, and sometimes successfully. If such is the case one often hears the remark: "Oh, well, he just stumbled on to this thing." But the fact remains that this man who tried things was the man who found out things, more so than the man who figures out things and does not try things. So it is with these various clay problems. Try things and you will find out things, for the theoretical part of the clay chemistry is not as yet absolute. What is meant by that is, there are still a great many unknown things about clays and their physical and chemical properties, and the man who tries things and finds out things may be the very man who discovers new avenues for chemical and physical research for the scientific man to follow up, and thus afford means to lead the clay man into proper channels.

One of the things in the clayworking industries which should receive more attention is, the manufacturer should tell the clay-washer why the clay shipment is different than the sample. With this knowledge the clay-washer may get an inkling where the trouble is and try some remedies. But with only an abstract statement that we cannot use your clay the clay-washer is completely at sea. There should be co-operation between the two branches, as one is practically dependent upon the other.

This withholding of guiding information from the manufacturer to the clay-washer had once been termed a species of dishonesty. In this particular case it looked very much like being true, in that the manufacturer after having condemned the clay, later on tried to buy this particular clay mine.

The present great European war has shown two things, one that the different countries are in a way dependent upon each other more than they ever knew, and the other one being that necessity is the mother of invention that is finding suitable substitutes, and with this view in mind it should be only a short time when this country should be free from the importation of clays by developing our clay resources, to take the place of the imported clays.

J. J. KOCH.

THE STEADY SUBSCRIBER.

How dear to our heart is the steady subscriber, who pays in
advance without skipping a year;
Who takes out his money and offers it gladly, and casts
round the office a halo of cheer,
Who never says, "Stop it, I cannot afford it," or "Getting more
papers each week than I read,"
But always says, "Send it, the whole office likes it, in fact it
is one indispensable need."
How welcome his check or his crisp U. S. dollar; how he
makes our heart throb and our eyes fairly dance.
We outwardly thank him, we inwardly bless him—the steady
subscriber who pays in advance.

—Revised version of lines by F. N. in National Food Magazine.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance) - - $ 2.00
One copy, one year (if not paid in advance) - - 2.50
Six copies, " " - - 10.00
Ten copies, " " - - 15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXV. MAY, 1916. No. 5.

CURRENT COMMENT.

Are you affiliated with the Building Brick Bureau?

* * *

This year is no time for cold feet in the brick boosting game.

* * *

Ohio produces one-fifth of the value of all clay products manufactured in the United States.

* * *

Tell us what you are doing in the way of local advertising that we may tell the other fellow and help the cause along.

* * *

About the time we get the spring fever out of our system we hear the call of nature and the discussion of vacation plans.

* * *

It is high time for another good crop of Build with Brick signs. If you have not put up your share of them yet this spring get busy and do it now.

* * *

The machinery men have had their inning this spring, and they have earned it too, for they have been patient and pushing all the time through the period of depression.

* * *

Even though we have had a few years of depression the clay products industry has shown good progress because it has more than doubled during the past twenty years.

* * *

Architects have been showing quite a lot of favor to terra cotta trim for a number of years now and the makers of this product are doing their best to merit a continuance of this favor.

* * *

The National Civic Federation has concluded that piecework and profit sharing is doubtful of general success. It seems too that union labor leaders are the main stumbling block in the way of progress along this line of effort to new industrial relations.

* * *

It is not only a sign of enterprise to be identified with the Building Brick Bureau but it is also a good business proposition.

* * *

Prompt service in filling orders for brick is worth enough that it pays to invest in sufficient extra equipment to make this practical.

* * *

Wherever you can use a gravity conveyor or other mechanical device for handling brick or clay do it and save time and money.

* * *

Most of the progressive farmers are already conbinced that tile draining pays and all they need is a little urging to drain their farms with clay tile.

* * *

This great country of ours is beginning to loom up big in many places in comparison with the rest of the world and to inspire a new order of patriotism.

* * *

One good way to beget a pride in your community is to be active in encouraging brick building, because good substantial brick homes make inviting surroundings.

* * *

Heat economy is such a hobby with some clayworkers that we will not be surprised to hear some of them suggesting plans to store up the extra heat of summer for drying brick next winter.

* * *

Let us make the slogan for the brick industry, fair prices as well as bigger business, because the two should go hand in hand and the brick trade has too long been sacrificing its profits on the altar of competition.

* * *

First the cement folks captured a few trenches from the brick industry by a free use of advertising and now the lumber folks are letting loose some broadsides of this kind, so it is time for the brick industry to mobilize all its resources and counter-attack.

* * *

When we consider the great educational work that has been done by the National Paving Brick Association there is no excuse for poor or improper street paving these days, and we are pretty close to it if not already at the time when it will not be tolerated by the public but the proper laying of the right kind of brick will be insisted upon.

THE DAY OF THE JUNK MAN.

This is the day of the junk man, it is a time in which the dealers in old iron and other metals are reaping a rich harvest, for there has never been a time in many years that all kinds of scrap metal was in such urgent demand at anything like as high prices. Many instances are related of the realization of something worth while from scrap metal and especially scrap tool steel gathered up around industrial plants.

It will pay every brick manufacturer under present conditions to overhaul his junk pile and gather up all scrap metal of every description, sort it and sell it out for what it will bring. To market it properly and get its full value he should in so far as practical, separate all the different metals. Steel commands a pretty good price and scrap tool steel has been sold for as high as $70 per hundred pounds, so it does not take a great deal of the right kind of scrap steel to make an item worth while.

While tool steel and scraps of copper and zinc and lead are among the more valuable of waste products in the junk pile everything in the way of metal finds a ready sale now at comparatively good prices. So it is a good time to have a clean-up of the junk and to realize from it, because prices are good and it improves its surroundings to clean up and get rid of all junk and scrap metal.

POTTERY PROPERTIES AROUND MACON.

The Chamber of Commerce of Macon, Ga., and the Central of Georgia Railway have issued and circulated a very interesting pamphlet on the subject of pottery possibilities in the vicinity of Macon, Ga. It includes government and special geological reports on the clay and kaolin deposits in that territory with analyses by T. Poole Maynard, Ph.D. The pamphlet is illustrated with maps giving locations and it is replete with valuable information for those interested in the subject of pottery and pottery clays. It also includes some statistical data and information about the city of Macon, tables of freight rates and other valuable information. It is a most complete report on the clay and kaolin deposits of that territory.

MOTOR HAULING.

There is nothing which will contribute more to make a man a hard worker for good roads in his immediate community than to undertake the use of motors for making deliveries at various overland points. This applies whether a man is in the brick business, lumber business or any other business that calls for heavy hauling.

In conversation with a man who recently purchased a truck for hauling of this kind he said that the truck gave excellent service and that the one thing bothering him most was the weakness of some of the bridges in some of the territory he had to cover. The truck would naturally carry a heavier load than a team and the old fashioned road bridges were often so weak that he was afraid of them.

We are gradually improving all our roads and a part of this improvement consists in the building of stronger bridges. The man who would put in a motor truck for hauling over a wide range of territory should carefully investigate the condition of bridges and take active steps to get those strengthened which are apparently weak. In this work a man should easily get the co-operation of all who operate either trucks or passenger machines and there are so many advantages in motor service for delivery in the surrounding territory that it is worth while even if it calls for some special work on roads and bridges.

Those who have experimented with it say that they can often make deliveries by truck 20 or 30 miles cheaper than they can load in cars and ship by rail and besides that they can make delivery direct to points which can not be reached by rail. The motor truck for delivery is coming into favor rapidly and spreading out extensively in the field of direct delivery from the brick plant.

PROSPERITY IN THE FIRE BRICK FIELD.

Fire brick making is one branch of clayworking that has indirectly prospered as a result of the turmoil in Europe. Fire brick are not used as munitions of war but they enter as important factors in the metal working industry which has been stimulated to unusual activity as a result of the war and through the activity in metal working a fire brick manufacturers have prospered. The fire brick trade, like nearly every other line of industry, suffered from the general depression of 1913 and also in 1914 up until the metal industries got busy and started an unusual demand for fire brick.

The depression early in the year was responsible for the fact that 1914 was not a big year in fire brick, the total being only $16,427,547 as compared to $20,627,122 in 1913.

In making the report on the fire brick industry, however, the U. S. Geological Survey called attention to the fact that fire brick is principally used in the iron and steel and coke making industries and its production rises and falls with the fluctuations in these industries.

That explains why and how the fire brick industry has prospered for the past year or more and seemingly is in for a good run of prosperity in the future. Not only are the metal industries all as busy as bees and enlarging their equipment but recent reports indicate that practically every coke oven in the country is busy and all of the industries calling for fire brick in large quantities are enjoying boom times.

All this means quite a lot to the clayworking industry because fire brick is the second item of importance in the brick and tile list though it ranks third if we consider pottery. In brick and tile proper, the only individual item exceeding the total value of the fire brick product is common brick. So prosperity in the fire brick division of the industry is quite a boost for the clayworking business as a whole and right now the fire brick manufacturers are in the middle of an era of unusual prosperity.

CIVIC REPORT ON PROFIT SHARING.

Just about the time everybody seemed agreed that we had reached a new period in industrial life, a new relation, where employes should share in some way in the profits and progress of the business, there is presented a voluminous report by the National Civic Federation, which has made a very exhaustive study of this subject, that expresses doubt of the success of the new ideas.

Some time ago the National Civic Federation took up the study of profit sharing plans and has since gone into it very thoroughly, having made a study of between 200 and 300 plans in active operation for profit sharing.

While the report is not encouraging, it seems that the employers as a rule are more in favor of profit sharing ideas than employes themselves. The main opposition to ideas of this kind come from union labor, which sees in practically all efforts made by employers to benefit industrial relations some sinister menace to the rights and the authorities of organized labor. It seems more than passing strange that labor organizations would object to any and all plans which have for their purpose the benefitting of employes. This is their attitude, however, as is evidenced by this exhaustive report. Also, it seems that entirely aside from the resentment of union labor leaders toward any plan not of their making or domination for the betterment of industrial relations, that the laborer, and especially the day worker, has a preference for receiving all that is coming to him in his regular pay envelope and not waiting and sharing in profits and bonuses.

The civic workers in their report divide profit-sharing ideas into three main divisions or schemes; first of which, the Eastman Kodak Co., of Rochester, is a good example, is where the employer agrees to pay his employes a certain per cent. of the profit of the business.

The second division takes the Crane Co., of Chicago, as a type and consists in the special distribution of gratuities in a variety of forms, ranging from discounts on supplies purchased to cash bonuses, made usually at the end of the year.

A third plan is that of stock ownership, which, it is said is being given noticeable test by the U. S. Steel Corporation.

On the subject of the Ford Motor Co., five dollar a day minimum, the committee reaches the conclusion that this does not fall within the standard definition of profit sharing and it is really a unique high-wage system, made possible only by extraordinary conditions.

In its report, the National Civic Federation confesses that it has been unable to learn with any degree of certainty the views of the rank and file of employes. Expressions from the employes' side have come mainly through representatives of labor unions and there is some question as to how faithfully these represent or present the sentiments of the rank and file of workers throughout the country.

While this civic report on profit sharing may serve to discourage the idea a little and render it less popular, still it serves more to illustrate the fact that in a great country like ours, there will never be a universal agreement upon any one thing because both interest and ideas differ. So far as profit sharing and new industrial relations are concerned, each individual manufacturer and his employes will thresh these out and follow whatever lines seem most satisfactory to themselves, regardless of what general opinion may be or what civic bodies may recommend.

WEDDING BELLS AT BIRMINGHAM.

Mr. and Mrs. John R. Copeland announce the marriage of their daughter Anne Sue to Mr. Frank Ward Cayce on Thursday, June 1, at nine o'clock at the home of the bride's parents, Birmingham, Ala.

HARLEY H. FATE TAKES A VACATION.

The host of friends of "Harley" Fate, president of the J. D. Fate Company, Plymouth, Ohio, will be surprised to know that Harley recently indulged in a vacation. However, it was forced on him. He had to go to a hospital in Cleveland for a minor operation, which was performed successfully, and when these lines are read by the trade, Harley will be back in Plymouth as good as new.

A BRICK WITH A MISSION.

A brick came through our office door today—nothing serious happened. The truth of the matter is we were rather pleased to receive it. It wasn't a heavy, well-burned one, but it was attractive. To let you into the secret, it was a leaflet mailed the trade by the Ricketson's Mineral Paint Works, of Milwaukee. The edges of the pamphlet were trimmed to represent a brick, and the cover was printed in red. On the front appears the trademark, "Ricketson's Red Brick Brand Mortar Colors," while on the back were these familiar words, "They Never Fade."

In the leaflet are illustrations of some of the buildings in which the mortar colors were used, a brief, forceful statement concerning the manufacturing of this high-grade material and directions for mixing.

The leaflet is indeed interesting and should prove of value to the users of mortar colors.

TRADE NOTES.

A. F. Gluck, secretary-treasurer of the Frontier Brick Works, Niagara Falls, N. Y., advises us that they are in the market for an electrically driven shovel with traction, using a one-quarter yard dipper.

The C. P. Mayer Brick Company, Bridgeville, Pa., has recently added a steam shovel to its equipment, for loading shale, and is installing crushers for preparing the material before it goes to the pans.

1916 GOOD ROADS YEAR BOOK.

A valuable addition to good roads literature is the 1916 edition of the "Good Roads Year Book," issued by the American Highway Association, of which Fairfax Harrison is president, Colorado Building, Washington, D. C. It is a substantial volume and furnishes an outline of the road conditions in each state, a brief review of the history of roads and the road system of other countries, an outline of the technical features of road construction and maintenance, an explanation of the different classes of highway bonds, and list of highway associations, producers of road materials and manufacturers of road machinery. It is the only source, the publishers state, of such comprehensive information concerning a branch of public work in which over $200,000,000 is spent annually. Price, $1.00 per copy, or five copies for $4.00.

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It Happened in London.

At one time during a season of heavy fog a London daily paper offered a prize for the best fog story. This story won the prize:

A merchant received a telephone message one morning from one of his clerks.

"Hello, Mr. Smith!" said the clerk over the wire. "I cannot come down to the shop this morning on account of the fog. I have not yet arrived home yesterday?"—Exchange.

Couldn't Fool Him.

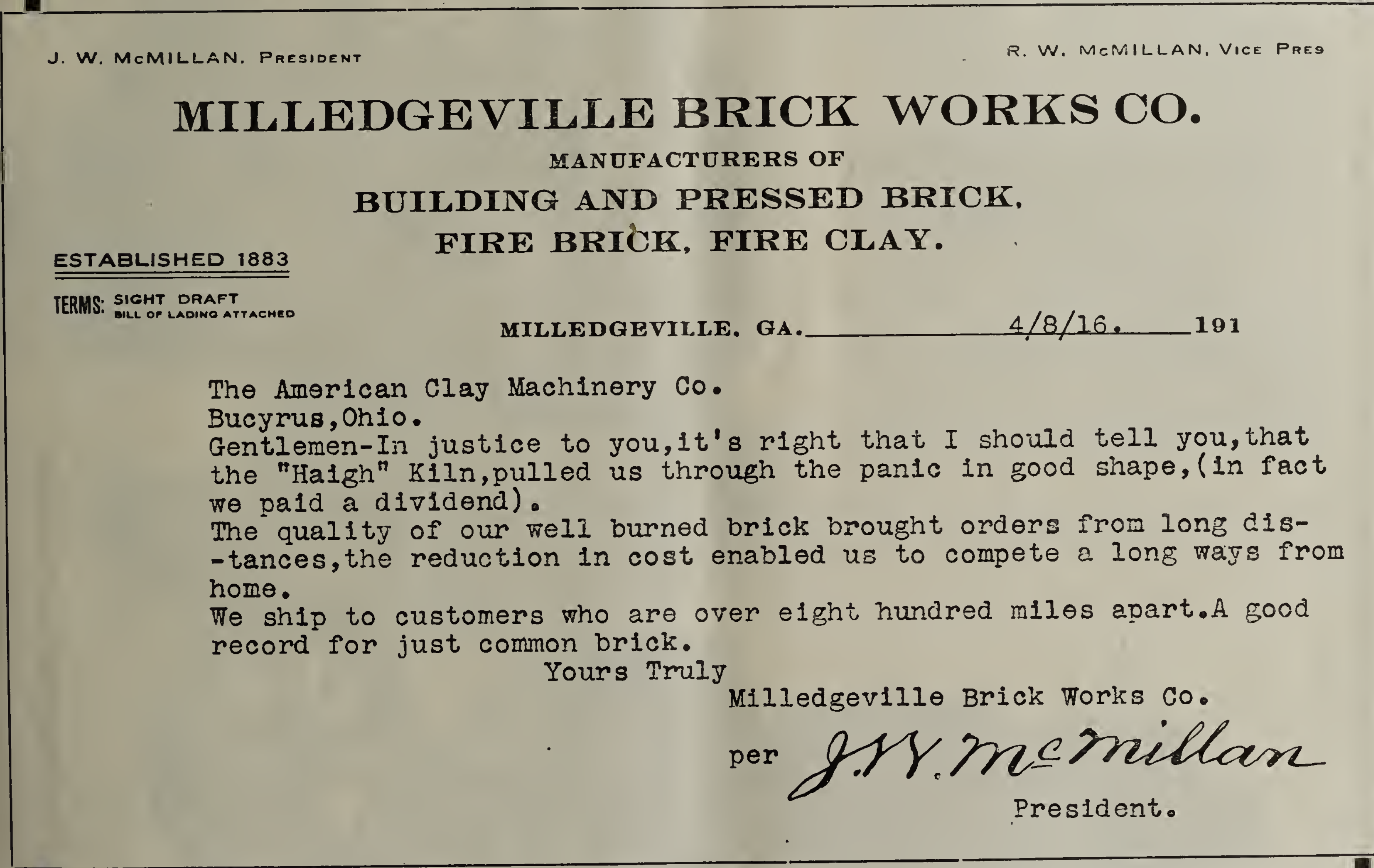
A Chicago violinist who gives concerts throughout the West was bitterly disappointed with the account of his recital printed in an Iowa town paper.

"I told your man three or four times," complained the musician to the owner of the paper, "that the instrument I used was a genuine Stradivarius, and in his story there was not a word about it, not a word."

Whereupon the owner said, with a laugh: "That is as it should be. When Mr. Stradivarius gets his fiddle advertised in my paper under two dollars a line, you come around and let me know."

To Ignore a Chance to Save is as Bad as Throwing Away Money

"The Proof of the Pudding Is in the Eating"



J. W. McMILLAN, PRESIDENT

R. W. McMILLAN, VICE PRES

MILLEDGEVILLE BRICK WORKS CO.

MANUFACTURERS OF
BUILDING AND PRESSED BRICK,
FIRE BRICK, FIRE CLAY.

ESTABLISHED 1883

TERMS: SIGHT DRAFT
BILL OF LADING ATTACHED

MILLEDGEVILLE, GA. 4/8/16. 191

The American Clay Machinery Co.
Bucyrus, Ohio.

Gentlemen-In justice to you, it's right that I should tell you, that the "Haigh" Kiln, pulled us through the panic in good shape, (in fact we paid a dividend).

The quality of our well burned brick brought orders from long distances, the reduction in cost enabled us to compete a long ways from home.

We ship to customers who are over eight hundred miles apart. A good record for just common brick.

Yours Truly
Milledgeville Brick Works Co.
per J. W. McMillan
President.

Mr. McMillan, who wrote the above letter, occupies a prominent place in the clay industry and is highly respected for his ability, shrewdness and honesty. His letter should appeal to every clayworker with peculiar force. Note what the Haigh Kiln did for him and write him if you so desire. We will show you what the Haigh will do for you and will show you one "in action."

Our Waste Heat Dryer, in connection with the Haigh Continuous Kiln makes a combination that will save more than half your fuel and more than half your labor. They will also improve the quality of your output. Write for printed matter.

Built Right Run Right

The American Clay Machinery Co.

BUCYRUS, OHIO

That Little Want of Yours Will Please Us Mightily. Send it Along.

Much the Largest Manufacturers of Clay Machinery in the World.

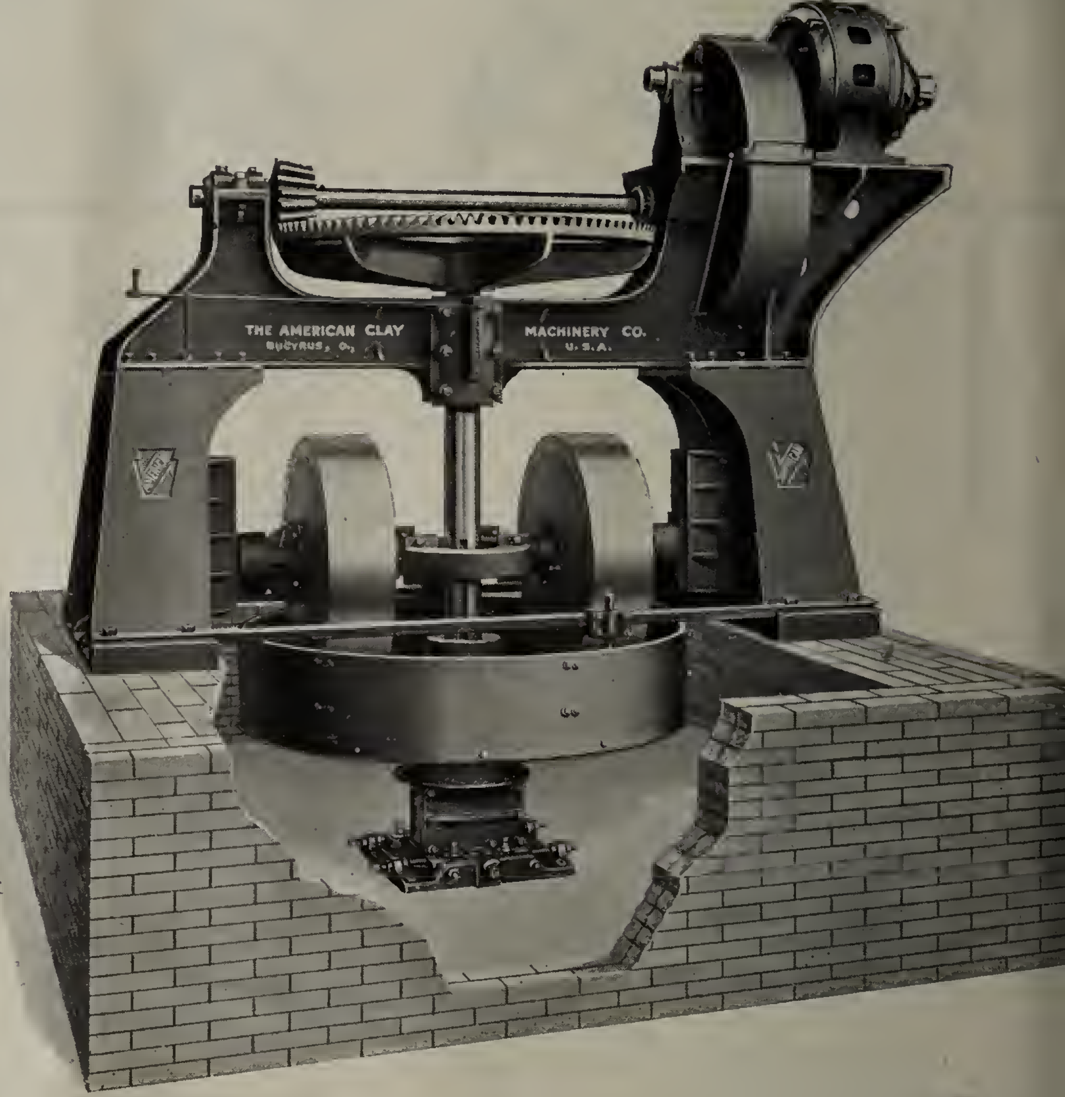
New AMERICAN

No. 335 Pan

For those who want a pan with short side frames resting on built up masonry, the American No. 335 will prove a popular favorite.

It has all the quality which its appearance indicates and will be found to be more than well built.

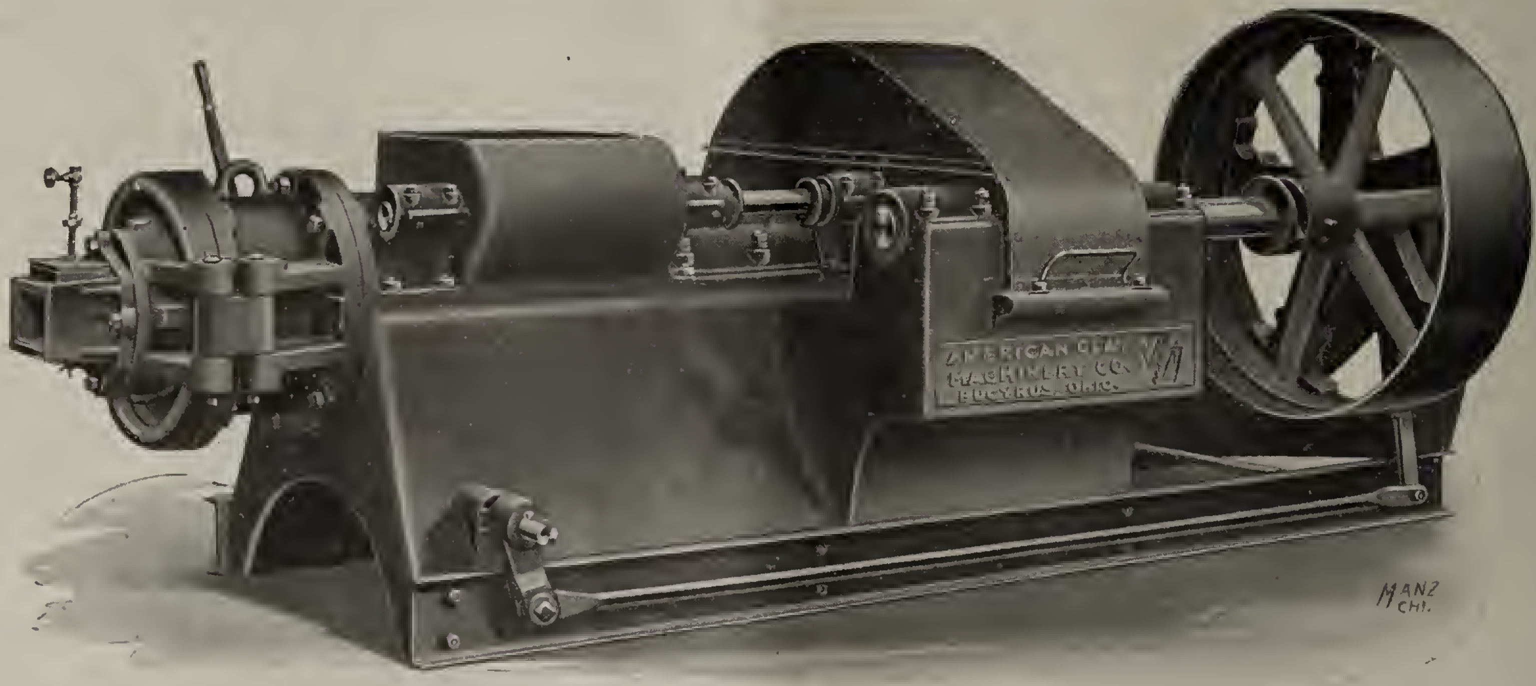
Let us send a full description of this excellent pan.



AMERICAN No. 290

Auger Machine

For the top notch of production and quality, both of machine and output, we highly recommend the American No. 290 Auger Machine. It is equally superior on Brick, Hollow Ware or Blocks and will give the highest satisfaction. Let us refer you to users of the No. 290. We will send you a full description and dimension sheet on request. Wc build every machine required by the clayworker.



THE AMERICAN CLAY MACHINERY CO.

Bucyrus, Ohio

Built Right Run Right

We Appreciate the Small as Well as the Large Orders.

Try Us on Your Little Needs and Remember us on the Larger Ones

American Steam Shovel

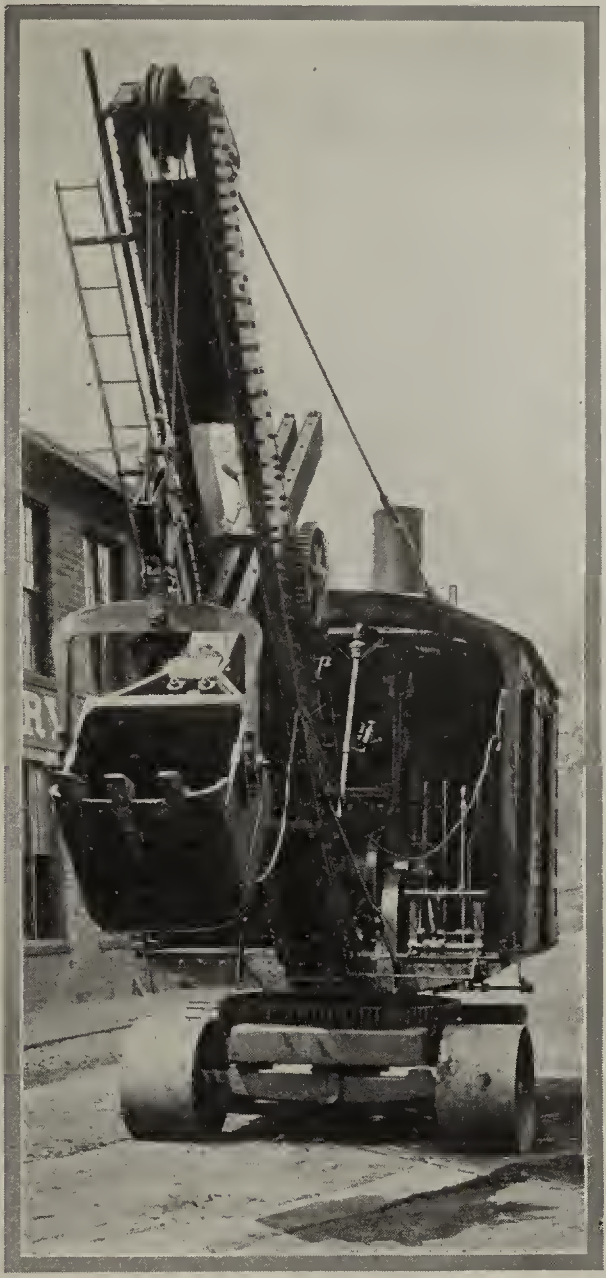
This shovel wasn't designed for the biggest contractors of the country or for digging the Panama Canal. It was built expressly for the clayworker and we claim a number of points of advantage for the American Steam Shovel when used for the clay pit.

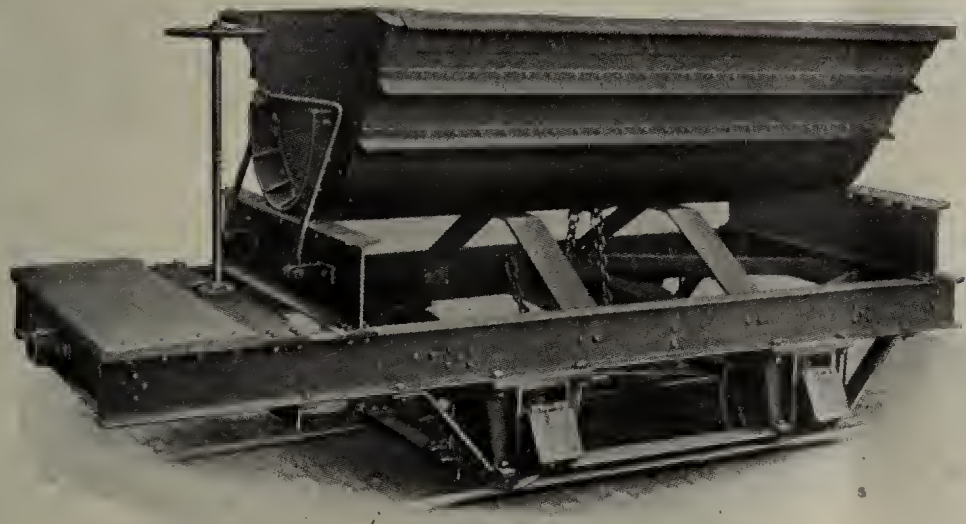
We have a catalogue full of details, description and cuts which will interest you. Let us send you a copy.

This American Shovel would be an excellent thing on your plant for other work besides digging clay or shale.

Our book tells the story.

WRITE FOR IT.





American No. 197 and No. 212 Steel Side Dump Clay Cars

AMERICAN
Steel Dump Cars

We build an excellent line of dump cars for both light and heavy work.

Here is our American No. 197 and No. 212 cars, the only difference being in the brake attachment.

For the rough use of the steam shovel we recommend this car. It is extremely well built of heavy material. It is substantially riveted and braced. It has convenient locking device to hold the hopper when loading and a safety device to prevent tilting the hopper too far in dumping. A full description of this car is yours on request. If you want a lighter car ask for it.

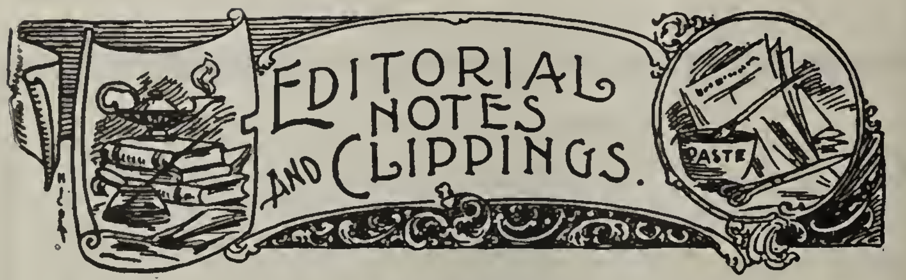
We build everything you need and build it right.

Have you seen the American Clay Magazine for May. Its free to you on request. It will help you to produce more business,

THE AMERICAN CLAY MACHINERY CO.
Bucyrus, Ohio

Built Right Run Right

The American Clay Magazine is a Live One. Its Yours for the Asking



EDITORIAL NOTES AND CLIPPINGS.

The Titus Clay Products Co., Columbia, S. C., plans to enlarge its plant.

E. A. Woolf and T. Lanning have purchased a site at Dennison, Ohio, on which they will build a brick and sewer pipe plant.

The Clay Products Co., Inc., has recently been organized at Fairhope, Ala., for the purpose of dealing in brick, pottery and other clay products.

George H. Tefft, of the W. S. Dickey Clay Mfg. Co., Kansas City, Mo., was recently appointed a member of the health and hospital board of that city by the mayor.

The plant of the Indiana Paving Brick and Block Company, of Brazil, Ind., has been purchased by the Dunn Wire Cut Lug Brick Company, of Conneaut, Ohio.

W. A. Howell, manager of the Collingwood Brick Company, at Toledo, Ohio, has announced an increase in wages ranging from eight to ten per cent., which went into effect May 1.

The pottery plant of the Kenilworth Tile Co., at East Liverpool, Ohio, was almost entirely destroyed by fire recently. The loss is estimated at $25,000, which is partly covered by insurance.

The Columbia Clay Company, of Columbia, S. C., has been incorporated, with $200,000 capital stock, to manufacture clay products and mine clay. The officers are E. H. Titus, L. S. Horton and W. F. Marshall.

Louis Lay has been making a number of improvements and changes in his brickmaking plant at Weir, Kans., and expects to run same to full capacity all during the summer, turning out about 50,000 brick per day.

The Geneva Brick and Tile Works, Geneva, Ohio, is to be a thing of the past after June 1, as the plant is to be dismantled and the land sold for farming purposes. R. M. Ashby has been manager of this plant for some time.

The Conard-Hallwood Brick & Tile Company, Columbus, Ohio, has been incorporated, with $50,000 capital stock, by John A. Conard, Henry S. Hallwood and others. It will build a plant to manufacture shale brick and hollow tile.

Salvador Madero, brother of the late Francisco L. Madero, Jr., former president of Mexico, has purchased a site at San Antonio, Texas., upon which he will build a large factory for the manufacture of building and ornamental tile.

George S. Shultz, a well-known brick manufacturer of New York City, died at his home in that city May 1. He was treasurer of the John B. Rose Brick Co., of Roseton, N. Y., for nearly twenty years. He leaves a wife and two grandchildren.

The Baltimore Brick Company, Baltimore, Ohio, sustained a $3,000 loss recently. Small buildings used chiefly for storage purposes were almost totally destroyed by fire which started from sparks from a passing engine. The loss is covered by insurance.

The Roundup Brick & Tile Company has been organized at Roundup, Mont., with $50,000 capital stock. The company has purchased an 80-acre tract of land on which there is a fine shale deposit underlaid with coal. Work on the plant will start in the very near future.

The plant of the Hayes Run Fire Brick Company, at Orviston, Pa., is running day and night in order to keep up with the demands for their products. This company ships brick, not only to distant points in the United States, but also exports them to Cuba and South America.

U. A. Cote, manager and owner of the St. Anne (Ill.) Brick and Tile Company, reports that business is unusually good and the demand for smaller tiles is so great that the company has had to refuse some orders for general delivery. A new kiln has been added and the daily output largely increased. Plans are now under way for the installation of an immense electric motor to take the place of the old steam engine.

A brick plant is needed at Zap, N. D., where there is a good opening for such an enterprise.

A. R. Baldridge, of Illiopolis, Ill., has taken over the Elgin brick plant at Hannibal, Mo., and will operate same to full capacity all summer.

The Acme Brick Company, of Fort Worth, Texas, has been incorporated by William Brick, W. R. Bennett, A. E. Newell and others with $150,000 capital stock.

John Andres, secretary-treasurer of the Standard Brick Co., Evansville, Ind., was recently appointed a member of the board of water works trustees by the mayor.

Mr. R. T. Stull, ceramic engineer of the Dunn Wire-Cut Lug Brick Company, of Conneaut, Ohio, was elected an honorary member of the Paving Brick Institute at the recent meeting at Portsmouth, Ohio.

John Collins, a former employe of the Coral Ridge Clay Products Company, Louisville, Ky., has brought suit against that company for $10,000 damages for injuries which he claims he received when employed at the plant.

W. G. Burke, of the Atlantic Coast Realty Company, Petersburg, Va., is interested in the organization of a company to establish a brick and tile plant at that place, and will be in the market for brick machinery and appliances.

Virgil M. Palmer has bought the Charter Oak brickyard at Elmwood, Conn., from B. H. Hubbard and will engage in the manufacture of brick. The plant has a capacity of 6,000,000 brick. Mr. Palmer was formerly manager of the brick exchange at New Britain.

J. B. Hammond, of Bolivar, Pa., and the Potter Title and Trust Co., of Pittsburg, have been appointed receivers for the Phoenix Fire Brick Co. and the Bolivar Face Brick Co., both of Bolivar. Bills in equity in both cases have been filed by H. Milton Brown, of Ashtabula, Ohio, a creditor. Mr. Hammond is president of both companies.

Charles Weelans, who was manager of the Weelans Pottery Company at Trenton, N. J., for twenty years, has associated himself with several wealthy men of Pittsburg, Pa., and will build a plant in Pittsburg for the manufacture of porcelain and pottery. Robert and Henry Weelans, of Trenton, are also interested in the new enterprise.

The sewer pipe plant of the Robinson Clay Products Company, at Parral, Ohio, which has been enlarged and remodeled, started operations May 8, after having been shut down for nearly a year. New pipe presses have been installed and the floor capacity greatly enlarged. A new brickmaking plant was placed in operation by the company some months ago. Herbert Enck is superintendent of the plant.

Capt. H. W. Graves, proprietor of the Graves Shale Paving Brick Company, one of the largest plants of its kind in the South, has sold his plant, near North Birmingham, Ala., to the Southern Clay Manufacturing Company, W. M. Lasley, president; T. H. Lasley, vice president, Chattanooga, Tenn., for a consideration in excess of $100,000. Captain Graves has been manufacturing paving brick for many years, and the excellent quality of "Graves paving brick" is recognized throughout the southern states, millions of them being laid in Florida alone, in the construction of county highways, many miles in length, connecting the county seats with the principal cities.

(Continued on page 620.)

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

TRADE B MARK

Barrett's PAVING PITCH

Main Street, Coshocton, Ohio. Brick Pavement filled with Barrett's Paving Pitch.

Pitch vs. Other Bituminous Fillers

ALTHOUGH for thirty years coal tar pitch has been a standard, economical and satisfactory filler for the joints of brick and block pavements, there are some engineers whose specifications call merely for bitumen, thus permitting the use of other bituminous materials in place of coal tar pitch.

Many other bituminous fillers resemble pitch, but in certain important respects are decidedly inferior to pitch.

Pitch filler can be used under poor weather conditions, while other fillers give their best results only in good weather.

Pitch requires less heat for application and hence is easier to apply correctly, and does not chill so quickly. It goes into the joints.

When pitch is pushed out of a joint by expansion, it follows back on contraction; other fillers do it less well or not at all.

Pitch is the most strongly adhesive bitumen and the most resistent to moisture, gas drips and the effects of illuminating gas in the ground.

The melting point of pitch within the joints remains practically constant year after year.

Pitch, even under the stress of extreme cold, still yields to the expansion and contraction of the pavement. Pitch sticks to the block. It cannot be pulled out after it is once in.

Don't specify bitumen. Specify pitch! The best pitch is Barrett's Paving Pitch, with a record of thirty years behind it.

Booklet free on request. Address our nearest office.

Barrett's Expansion Joint

Here is something every engineer will be interested in — Barrett's New Expansion Joint. It is made by the Fibre-Weld Process, which produces a bituminous mastic of unusual texture, having high tensile strength and retaining its shape at all paving temperatures.

It is absolutely waterproof and not injured by street acids or automobile oils. It is flexible and pliable under all weather conditions.

The material comes ready-to-lay, in handy ribbon form, in all practical widths and thicknesses.

Circular telling about it free on request.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
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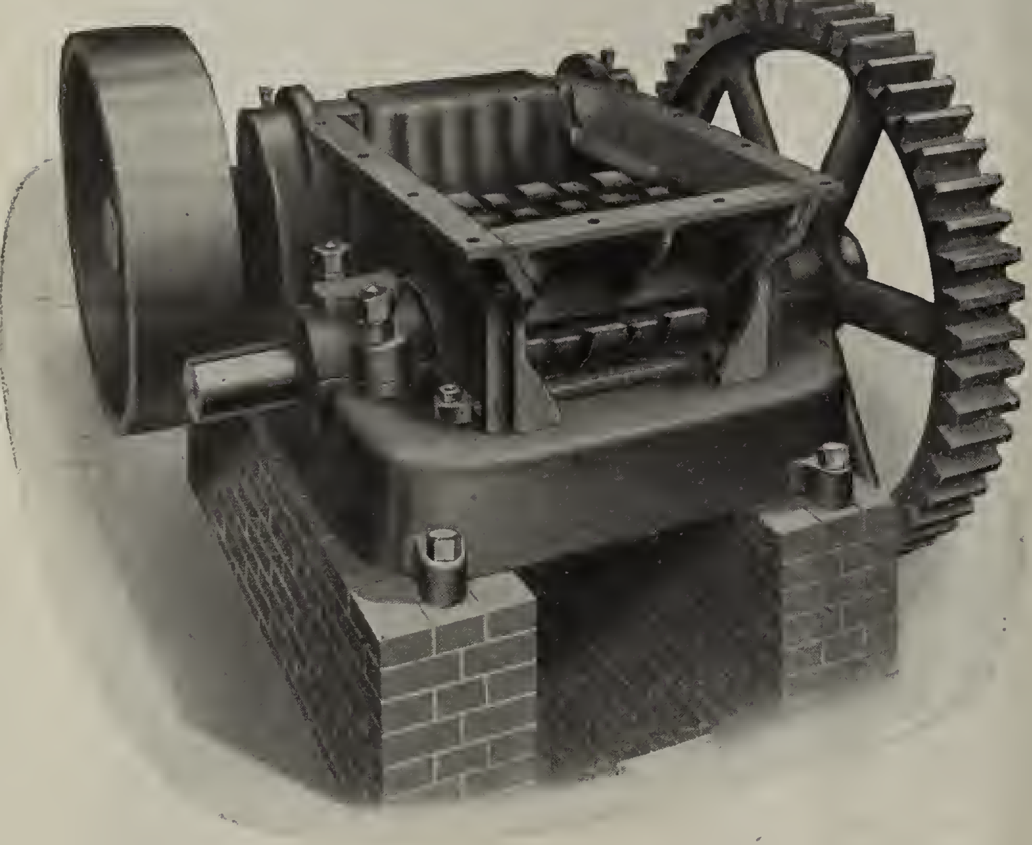
MECO SINGLE ROLL ROCK AND SHALE CRUSHER



furnishes an

Invaluable
Indispensable Aid
Inexpensive

for ideal grinding conditions.

Saves labor and Dry Pan Maintenance.

It doesn't clog.

Its first cost is low and upkeep practically nothing.

We can not tell all of its good points in this space, but our booklet does it in a most clear and comprehensive manner. We court the privilege of sending you a copy.

The Manufacturers Equipment Co.
The Clayworkers Furnishing House
Dayton. Ohio, U. S. A.

Western Agent:
Geo. H. Smith, 510 Reliance Bldg.
Kansas City, Mo.

EDITORIAL NOTES AND CLIPPINGS (Continued).

The Clark Brick Company, at Cromwell, Conn., will electrify its plant this spring.

G. K. Hundly contemplates establishing a brickmaking plant at Hopewell, Va., with a daily capacity of about 20,000.

The Monroeville Clay Products Company, of Monroeville, Ohio, has been organized with $50,000 capital stock. Work on the plant will begin in the very near future.

Fred W. Cubbins, manager of the Memphis Brick Co., Memphis, Tenn., died at his home in that city last month. Mr. Cubbins was forty-five years old, and had figured prominently in the industrial life of Memphis.

The Ada Brick & Tile Co., of Ada, Okla., is planning to treble its capacity. This is made necessary owing to the increased demand for its product. The company recently purchased an immense tract of land containing excellent shale deposits.

The Lonsdale Brick & Pottery Co., of Knoxville, Tenn., has been incorporated, with $25,000 capital stock, by L. D. Morris, A. C. Morris, Henry Hudson, G. Penland and F. W. Flenniken. The company has taken over the old Lonsdale brick plant and will start operations immediately.

The labor difficulty between the Streator Clay Manufacturing Co., of Streator, Ill., and its employes has been satisfactorily settled and the men returned to work after a shut down of about a week. The question involved was not one of wages, but as to whether certain men employed by the company should join the union.

C. W. Martin, formerly manager of the Wise County Brick Co., Bridgeport, Texas, has assumed control of the Athens Tile Company, at Athens, Texas, which will be reorganized and will operate under the name of the Athens Tile and Silo Company. Extensive improvements have been made in the plant and the daily capacity of the plant will in the future be about five cars of hollow building tile, fire brick and silo tile.

At the annual meeting of the Potomac Fire Brick Company, Piedmont, W. Va., the reports of the officers showed that the company was in very good shape financially and was making considerable progress. The following officers were re-elected: John A. Caldwell, president; M. A. Patrick, vice-president; John P. Miller, secretary and treasurer, and W. F. Caldwell, manager.

An innovation in the way of brick is now being introduced on the Nashville, Tenn., market by W. G. Bush & Co. This brick is a "mat" brick of rough texture different from any other brick now on that market. It is made in a number of colors and shades, and offers the builder an opportunity to bring out a number of colors heretofore unknown in brick buildings. This brick is made in Nashville and costs no more than the ordinary face brick.

An announceemnt has been made by the Ochs and Frey Brick Co., of Allentown, Pa., that all employes of the company will be given a twenty per cent. wage increase will affect about fifty men. The Ochs and Frey company is extremely busy at present owing to the extensive building operations in and about the city, and the officials of the company believe in giving their employes a bit of the prosperity they are enjoying.

E. M. Matthews, an employe of the Lake Union Brick Company, of Seattle, Wash., slipped on some wet clay while feeding the clay crusher and fell into the machine. There was no witness to the accident and it was not known that the man was in the crusher until it was noticed that the machinery was stopped. It was necessary to amputate one of his legs. Scant hope is entertained for his recovery.

The Marcy Lumber Company, Palmer, Mass., is planning to operate a brickyard this season at West Bemifield. Such repairs and changes as are necessary are to be made as soon as the weather permits.

The New England Brick Company, Boston, has orders to furnish its "Harvard Reds" for a number of expensive residences to be erected in Cambridge. The houses run from $15,000 to $30,000 in value. This type of brick has long been used in constructing the university buildings and it is to insure uniformity that they have been chosen for these residences. The demand for them steadily increases, too.

The Canadian China Clay Company, Montreal, has filed articles of incorporation with a capital stock of $1,500,000 to develop kaolin deposits in Amherst Township, Que., and it is expected that a clayworking plant will be constructed at an early date. Alex. Orsall is president; C. G. DeTonnancour, A. G. Gardner, William Mackenzie, Toronto; Donald Mann and others are in the company.

Brickmakers who are Rotarians seldom fail to take advantage of an opportunity to boost the "Build With Brick" campaign, and as the members of the various Rotary Clubs are, as a rule, the live wires in their respective communities, it is effective advertising. H. M. Guy, manager of the Capital City Vitrified Brick & Paving Company, Topeka, Kans., recently entertained the Topeka Rotary Club with a talk on bricks and brickmaking in general and the methods employed at his plant in particular.

B. F. Carter, one of the pioneers of Oshkosh, Wis., and a well known brick manufacturer, died at his home April 28. Mr. Carter was 90 years old and had been vice-president of the Cook & Brown Lime Company ever since its incorporation in 1887, although he had not been actively engaged in business for some time. He is survived by four sons and three daughters. Two of his sons being Henry W. Carter, of Oshkosh, secretary of the Cook & Brown Lime Company, and F. R. Carter, the well known brick manufacturer of Peoria, Ill.

The Idaho Brick Company, located in Troy, Idaho, has been compelled to enlarge its plant owing to a constantly increasing demand for its products. Besides the present kilns, one of which has a capacity of 140,000 ordinary fire brick, the company is excavating for two more kilns of the same capacity and will also put in more machinery. Although the company is receiving large orders daily, the largest individual order so far received comes from a coast firm, which will require about twelve cars. The plant was put into operation eighteen months ago.

Work of installing a new hot-air drying system in the plant of the Youngstown Clay Products Company, of Volant, Pa., has been completed and the new system is now in use. It is regarded as an immense improvement over the old steam system of drying formerly used. The capacity of the plant will be increased about 25 per cent. This plant, which has been very successfully operated with J. J. Wadlinger in charge, is now turning out over 40,000 brick a day and with the new system, the company will be able to fill their constantly increasing orders.

The organization of the Denison Interlocking Tile Corporation, of Cleveland, Ohio, with a capital stock of $500,000 has been announced. This immense corporation is the result of the merging of the Denison Tile Engineering Co. and the Interstate Clay Products Co., both of Cleveland. Bert J. Graham, president of the International Clay Products Co., will be president and general manager of the new organization. Offices of the new company will be in the Hippodrome building. The interlocking tile business, originating in Cleveland five years ago, has grown until the concern has twenty-six factories and sixty sales offices in the United States, and several in Canada. An advertising and sales campaign extending to Europe and South America is planned.

Everybody wants in on a GOOD THING as soon as it is

A PROVEN SUCCESS.

A few years ago in this section of Ohio ONE COMPANY installed our system —today

SIXTY-FIVE COMPANIES

have installed and have our Hook Kilns in successful operation.

Isn't this proof enough that Hook Kilns are efficient **TIME** and **FUEL SAVERS?**

The **JUDGMENT** of these companies is that "Hook Kilns are **GOOD.**" **YOU** can reduce **YOUR MANUFACTURING COSTS** by taking advantage of this **OPPORTUNITY.**

Join the ranks of **LOW-BURNING-COST PRODUCERS. Write to us now.**

HOOK PATENT KILN CO.

VIGO, OHIO

Canadian Office
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HOOK KILNS ARE OPERATED ALL OVER THE CENTRAL WEST.

EFFICIENCY---DURABILITY---ECONOMY

Who Pays?

for the wasted power to drive the line shaft when several of your machines are idle —YOU —but you can stop this waste with—

Westinghouse Motor Driving a Dry Pan

Westinghouse
Individual Motor Drive

Individual motors make each machine an independent unit. You do not have to furnish energy to drive fifty feet, or more, of shafting to operate a single machine.

A card will bring full information

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.
Sales offices in all large
American cities.

ANALYZING CLAY AND PHYSICAL TESTING

(Continued from page 561.)

cubic centimeters of concentrate ammonia and a little ammonium oxalate and continue boiling for a few minutes. Stand the solution in a warm place for four or five hours to allow the precipitate to collect and settle. Slightly more ammonium oxalate than is required all the calcium and magnesium into oxalates must be added, but a very large excess is not best and should be avoided. The precipitated calcium oxalate should be filtered and thoroughly washed with hot water to which a few drops of ammonia have been previously added. The filter, wrapped around the precipitate, should be placed in a crucible. At first, heat gently until all moisture is driven off, then ignite intensely with a blast lamp for, say ten minutes, cool in a dessicator and weigh. Then ignite again for five minutes, cool and weigh. If the weights are the same in both cases it is, of course, unnecessary to repeat the operation, but it should be continued until a constant weight is obtained. When a constant weight is obtained, the precipitate may be considered calcium oxide and from this weight calculate the percentage of calcium oxide in the sample.

In making a determination of magnesium in a sample, the filtrate should be about the same as in determining the calcium oxide, that is, about 250 cubic centimeters, and if the filtrate is more than that it should be evaporated to that point. Cool the solution by standing the beaker in cold water and when cold add an excess of sodium-ammonium phosphate, drop by drop, while stirring continuously. After this has been done, add concentrate ammonia equal to about one-third the volume of the solution. Stir the solution three or four times after adding the ammonia, stand it in a cool place for about six hours to allow the precipitate to settle. Filter the solution and wash the precipitate thoroughly with cold ammonia containing a little ammonium nitrate. The ammonia used in this case should be one-third strength. After this treatment, dry the precipitate in an air bath, remove it from the filter and burn the filter in a weighed crucible. When this is cool, add the precipitate, ignite intensely with a blast lamp for ten minutes, cool in a dessicator and weigh; repeat this until a constant weight is obtained, as before, and when this constant weight is obtained the remainder consists of magnesium pyrophosphate. From this, calculate the percentage of magnesium oxide in the sample. A calculation of this kind involves chemical calculations that require a knowledge of stoichometry and which, in a paper of this kind, cannot be taken up. However, practically 22 per cent. of magnesium pyrophosphate is magnesium and this figure can be safely used in such calculations.

The alkalies, sodium and potassium are ordinarily present in small quantities in clay. They lower the fusing point of clay and must not be present in excessive quantities in any material that is expected to be exposed to an intense heat. The alkalies in any considerable quantities render a clay unfit for refractory ware. It is also desirable to have little or no iron present in material to be used for lining crucibles, furnaces, for making steel and iron, etc.

In making the determination for alkalies, weigh out one gram from the bottle of dry material, add one gram of pure ammonium chloride, grind them together intimately; then add seven grams of pure calcium carbonate, grind the whole together in a mortar. Weigh out one gram of pure calcium carbonate, transfer it to a platinum crucible and pour the mixture from the mortar on this and cover the mixture with one gram more of calcium carbonate. Put a cover on the crucible and heat very slowly at first, but gradually increase the temperature until it reaches dull redness and continue heating at this temperature for about an hour. Treat the whole with hot water in a porcelain dish. If there are any lumps in the mixture, pulverize them with a pestle, then boil until the mass is thoroughly disintegrated. Filter off the insoluble matter and wash it with hot water until a small test of the filtrate collected in a test tube and acidified with nitric acid shows only a very faint cloudiness when silver nitrate is added. Place the filtrate over a burner and evaporate to about seventy-five cubic centimeters, then remove it from the flame and then add a few drops of chemically pure ammonia, and then add a strong solution of ammonium carbonate as long as a precipitate is formed. Stir for a few minutes and allow the precipitate to completely settle. Filter and receive the filtrate in a porcelain dish, and wash with hot water rendered slightly alkaline until the washings come through free from chlorine.

Add a few drops of hydrochloric acid to the filtrate and evaporate to a small quantity and transfer to a platinum dish, washing in the last portions with a little distilled water. Distilled water may be obtained in various ways. If necessary, a retort with a Liebig condenser can be fitted up for this purpose at a very moderate expense. Also, a small still may be used. It is often possible to buy distilled water at a few cents a gallon.

Evaporate to dryness on a water bath and expel all water at a low temperature, after which increase the temperature to drive off ammonium compounds, then raise the temperature to red heat—a very faint red. Cool, dissolve the residue in a little water, add a drop or two of ammonia, and then a few drops of ammonium carbonate and heat on a water bath for a few minutes. Filter and wash with water rendered faintly alkaline with ammonia. Transfer the precipitate to a small weighed platinum dish. Acidulate the filtrate with a few drops of hydrochloric acid, evaporate thoroughly on a water bath, then put the dish in an air bath and raise the temperature to about 140 degrees Centigrade, which is 284 degrees F. Now remove the dish from the air bath and heat it slowly, finally raising the heat until it becomes faintly red. This expels the ammonium salts. Cool in a dessicator and weigh as before. The weight is the combined chlorides of sodium and potassium. The percentage is calculated from this precipitate.

In making these calculations, it has already been noticed that a very sensitive balance is required. It is hardly necessary to supply instructions for using a balance. Any dealer will supply this information. Besides, there are many kinds of balances and so a comprehensive explanation would be impossible. But, by all means, the balance should be enclosed in glass. In determining very minute weights, the slightest draft will throw the instrument out of balance, which is the reason for enclosing in glass.

Fig. 8 shows an excellent balance. This is sensitive to 1-500 milligram. This is much more sensitive than is required for ordinary analyses. The balance is also more expensive than is necessary for any ordinary work. The illustration is produced to give an idea of a first class instrument.

It is frequently desirable to make physical tests of shale or clay for various purposes. A physical test is not a difficult one, but in order to draw conclusions of value it is necessary to have had some experience and good common sense. Physical tests are conducted for various purposes, but in this paper only those conducted for the purpose of determining the fitness of a shale or clay for brick will be considered, though in a modified form the same tests will apply to material for hollow ware and tile. It must be remembered, too, that a test such as outlined here, is useful but cannot be so conclusive as a complete brick plant equipment.

The material to be tested should be placed in an iron mortar and thoroughly pulverized first. This operation corresponding to the work done by a dry pan in actual practice. Then the material is carefully screened, in a manner corre-

(Continued on page 624.)

HOOK'S
LATEST IMPROVED SYSTEM
For Burning Clay Products
MEANS SUCCESS

Scores of Brick and Tile manufacturers in the United States and Canada are burning their ware successfully with

LATEST IMPROVED HOOK PATENT
UP and DOWN DRAFT KILN

In one section of OHIO where this latest IMPROVED KILN is best known, one of our representatives took orders for over

20 KILNS IN 3 DAYS

This evidence certainly favors the installation of THE UP AND DOWN DRAFT SYSTEM

Do not be deceived, insist on having HOOK'S LATEST IMPROVED PATENT KILN.

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ELLIS LOVEJOY
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Geological Examination of Properties

Clay Testing

Investigation of Manufacturing Propositions

Plants Designed, Construction Superintended and Operations Directed

Dryers, Furnaces, Kilns

Remodeling Old Plants Given Special Attention

Development of New Lines of Products

Appraisal of Plants

ANALYZING CLAY AND PHYSICAL TESTING

(Continued from page 623.)

sponding to the work done by a piano wire screen. This may be done with any kind of cheap sifter, or, if one is sure that the material is entirely free of lumps, screening may be unnecessary. Water is then added in sufficient quantity to make up a stiff paste. The mud is then thoroughly worked with a pestle, which is somewhat similar to the action of pug knives in a pug mill. When the mud is thoroughly worked, it is pressed into balls about two or three inches in diameter. Of course, the pressure that can be put on the material cannot compare with the pressure of an auger machine, and it is further impossible to ascertain whether or not the material will laminate. Several samples should be made and dried in very unfavorable, moderately favorable and very favorable places. This test will indicate whether or not the shale or clay is plastic or short, whether it is gummy or not, whether it can be dried very rapidly without cracking, or whether it must be dried very slowly. If there are any stones in the material, the kind and quantity should be very carefully noted. Stone of any kind in clay is not desirable, but considerable quantities of limestone is specially detrimental. If the material to be tested is shale, it will nearly always be best to use a dry pan to pulverize it, in actual practice, of course, not just for making a preliminary test, but if the shale is in a disintegrated state, as it sometimes is, a disintegrator may be used.

Usually, though not always, a plastic clay is somewhat more difficult to dry than a "short" clay, but is more easily molded.

There is room for much valuable investigation to be done in the field of the chemistry of clay. Much has already been done, of course. It would seem that the practical brickmaker might be able to conduct experiments, that by reason of his practical knowledge, might be more valuable than if such experiments were conducted by strictly scientific men.

It may be objected that the practical man is not scientific. That is quite true, too. But it seems that there is no reason why a practical man should not conduct experiments of a scientific nature without necessarily being a chemist.

A chemist is not supposed to be thorough in every department of chemistry. A first-class chemist for a steel plant may know a great deal about metallurgy, he may also understand the manufacture of toulene and xylene, but he may know no more of hyoplasmatic reactions than a ring-tailed ape. So, if the chemist makes a special study of the chemistry of living organisms, he may not be at all familiar with metallurgy. Basing my opinions on these facts, I conclude that it is quite necessary for one to be a chemical engineer in order to make investigations of the chemistry of clays that may add valuable knowledge to what is already known.

OLD AXIOMS REVISED.

"A burned brick stuns the fire."

"It's a long road that has no brick in it."

"An ounce of prevention (brick) beats a pound of cure."

"Where ignorance is bliss tis folly to use brick."

"A brick sixpense beats a frame shilling."

"The devil finds some wooden homes for idle flames to do."

"When brick are away the flames will play."

"When the devil is sick, the devil a monk is he, but when you build frame the devil makes a 'munk' of thee."

DAVID UP-TO-DATE.

When David killed Goliath with hand sling and a rock,
It made the stone men chesty and in stone they set much stock.
Since the days of old Goliath they have used stone on the road
Until the nation staggers on its giant up-keep load,
And it looked as though poor David had put us all in hock.
When he grabbed up as his weapon a little bit of rock.
But there's a David in the field to make repair cost sick
The weapon is most modern and it's called—the Paving Brick.

—American Clay Magazine.

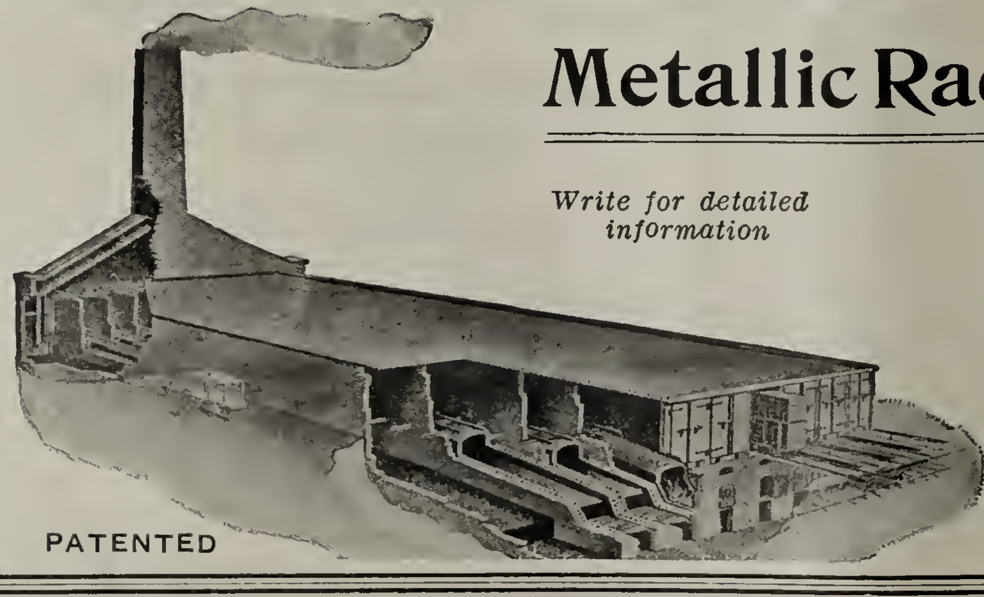
THE OPENING OF THE SEASON.

Faithful wives of golluf geezers, you'll be lorn and you'll be lone;
Vain the tempest of your anger, vain each sigh and mournful moan;
Vain the tears which fall and splash upon your oriental rugs—
Tears will not bring back your husbands, for your husbands they are bugs.
You cannot retrieve providers while the golfing season runs,
And your daughters will be orphans—orphans, too, your beamish sons.
You'll be widows in the morning, in the evening and noon—
Faithful wives of golluf geezers, hark the burden of my croon:
You are going to lose your husbands—very soon—very soon!

For the fuzz upon the linkses is a cleaner, greener hue,
And the balmy zephs are zephing and the sky's a nifty blue,
And the little birds are birding in the branches overhead,
And the lotions are arriving where the Nineteenth Hole is spread.
Do not weep, you faithful wives; sniffle not, it gets you nix,
For your husbands will not heed you once they've beat it with their sticks;
Once upon the links, they're distant as the mountains of the moon—
Faithful wives of golfing filberts, hark the burden of my croon:
You are going to lose your husbands—very soon—very soon!

—Book of Smiles.

The best of men, like the best of autos today, are self-starters, they don't have to be pushed along or cranked up.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Metallic Radiation Heat Dryers

Write for detailed information

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KILN FLOORS AND FURNACES

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(Inc.)
5116 Walnut St. Philadelphia, Pa.

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Dries Easily the Most Tender Clays.
No Live Steam---No Drying at Night.

BOSS SYSTEM of BURNING BRICK

Use the Cheapest Slack Coal or Screenings
and Cut Your Fuel Bill in Half.

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1916 ANNOUNCEMENT

We want a SWIFT SLACK COAL BURNING KILN and a SWIFT HOT-FLOOR DRYER in your vicinity. If there are none—to the first one answering this ad we will furnish one or both PLANS at a cost of the plans alone.

Drop a line to

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Lock Box 269, OTTAWA, ILL.

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WRAPPED TWISTED SOLDERED

Combining all the best of looped wires with the Red Label features of other makes superior quality of our Piano Wire.

The WEBB WIRE WORKS, New Brunswick, N. J.

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Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

FOR SALE.

Bonnot Brick Machine, cut off, pug mill and repress. First class condition. Address
BOX 133,
Danville, Ill.
2 6 d

FOR SALE.

Complete soft-mud brick-making outfit, including machines, disintegraters, pulleys, shafting, engine, boilers, racks, pallets, barrows, etc. Very cheap to quick purchaser. Apply to
CHEWNING & BOXLEY,
Richmond, Va.
5 1 dm

BRICK PLANT FOR SALE.

Fully equipped with auger machine, full set of grinding machinery, 5-track steam dryer, tram way, cars, 75-h.p. engine and 30 acres of finest clay. Capacity, 20,000 daily. Bargain. Address
A. C. BARNETT,
Washington, Ga.
4 2 cm

FOR SALE.
BRICK PLANT.

Located in central Ohio on first-class railroad. Unlimited supply of shale; twenty-two kilns suitable to make rough face builders, or pavers. Capacity, 50,000 daily. Plant is in shape to operate in two days' time. Terms, one-half cash; balance one year.
THE KIRSCHNER BRICK CO.,
221 West Ninth St.,
Cincinnati, Ohio.
4 3 cm

FOR SALE.

One type "O" Thew automatic shovel, shop number 687, bought February, 1912. Only used to dig about 18,000 yards of clay. In splendid second hand condition. Price, $2,500.00 F. O. B. cars Memphis, Tenn.

Also six Quincy clay gatherers in fair condition, $100,000 each F. O. B. cars, Memphis, Tenn.

One Buffalo gasoline engine type J. J. 25 h.p., nearly new, used about one month. Price, $400.00 F. O. B., Memphis, Tenn.

One slide valve engine in good repair, 14 by 22 inches, 11-foot flywheel. $300.00 F. O. B. Memphis, Tenn.
SOUTH MEMPHIS BRICK CO.,
Memphis, Tenn.
5 tf d

FOR SALE.

Brick plant complete. General building conditions attractive. Modest investment required.
JOHN E. NICKERSON,
Lewiston, Idaho.
4 3 d

FOR SALE.

One Worthington 10x5x10 Duplex pump. Capacity, 250 gallons per minute. Equipped with Fisher governor. Excellent for fire protection. Address
BOX 4-TERRA COTTA,
Care Clay-Worker.
4 3c

FOR SALE.

Brick yard site, rare opportunity for brick man with capital and energy to get control of one of the best brick yard sites in the Middle West. An abundance of good clay. First-class shipping facilities. Address
BOX 5—C. J. H.,
Care Clay-Worker.
5 1 cm

FOR SALE.

Ninety-five acres red and white shale land within 20 miles of Toronto, Ont. Good shipping facilities. Two lines of railway. A bargain. Investigate.
A. C. ROBERTSON,
39 Russet Ave.,
Toronto, Ont., Can.
5 3 cm

FOR SALE, AT A BARGAIN.

One Kells brick machine, almost new. Wheelbarrows and pulley. For $100.00. Must be sold to settle an estate.
MRS. R. E. COOK,
Red Oak, Ia.
4 2 cm

FOR SALE.

Jaw crusher, 15x9 inches, Allis-Chambers, new style Blake, manganese steel jaw plates. Capacity one-inch size, six tons per hour. Good condition.
THE COLUMBUS IRON & STEEL CO.,
Columbus, Ohio.
3 3 cm

FOR SALE.

Two Richardson steam represses.
One American large size automatic rotating cutter.
One Berg 4-mold dry press.
One Means wood frame 9-ft. dry pan.
One Freese Union brick machine.
One Freese automatic rotating cutter.
One Hetherington rattler, almost new.
Six hundred feet 70-lb. Tee rail.
Irons for hot air dryer.
One small concrete mixer.
One Atlas engine, 14x26.
Address
FRANK H. ROBINSON,
1230 Fulton Bldg.,
Pittsburgh, Pa.
4 27 d

FOR SALE.

Two No. 36 American Ring Hammer pulverizers; run only a short time. Address,
L. L. STEPHENSON,
Lovick, Ala.
5 tf d

FOR SALE.

A new four-mold Ross-Keller triple-pressure brick machine. Great bargain. Must sell.
MISSOURI BOILER CLEANER CO.,
410 N. Commercial St.,
St. Louis, Mo.
3 3 cm

FOR SALE.

One complete soft mud outfit, consisting of one Hercules Sr. machine, one pug mill, mold sander and cap elevator. All in good working condition; only used two years. This must be sold to make room for hollow ware outfit. Will go very cheap.
A. FRIES & SONS,
Connersville, Ind.
4 2 d

FOR SALE.

One No. 1 Monarch brick machine.
One Potts mold sander.
One Potts disintegrator.
One 35-h.p. Richards engine.
All in A-1 condition. Will sell cheap.
WALTER J. SIMON,
Sawyer, Wis.
4 3 cm

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The face brick "Boom" is on the way. I have the best brick plant proposition in the country for sale or rent on easiest terms. Rare chance for man with small capital.
A. G. T.
Care The Clay-Worker.
3 tf dm

FOR SALE.

Lyon four-mold dry press.
One American 14 ft., open top lug mill.
One Raymond 777 auger mill. All in good condition.
WALSH FIRE CLAY PRODUCTS CO.,
St. Louis, Mo.
4 3 c

FOR SALE.

The following machinery will be sold at a great bargain.
One E. M. Freese combined stiff mud machine.
One hand cutting table and one clay gatherer.
Eleven wheelbarrows.
Address
BOX 4-PORT,
Care Clay-Worker.
4 2 c

FOR SALE.

Complete brickmaking outfit. One 9-ft. Stevenson dry pan. Freese pug mill and automatic cutoff. Three hundred and fifty steel cars, two steel side dump clay cars, 150-h.p. boiler, stands inspection. Seventy-five-h.p. engine. About ten tons 16-lb. Tee rails, etc.
G. H. HEIMISCH,
Portsmouth, Ohio.
4 2 cm

Classified Advertisements.

FOR SALE.

Champion mold sander, practically new, only used a few weeks. Address

BOX 5—NEW JERSEY,
Care Clay-Worker.

FOR SALE.

A GREAT BARGAIN.

An Oliver Typewriter, most recent style, just as good as new, having been used as a demonstrator only. Carries factory guarantee. Will be sold for half price for cash. Address

BOX 6—OLIVER,
Care Clay-Worker.

WANTED, ETC.

WANTED.

Position as foreman or head burner, 20 years' practical experience. Dry press, pavers, flash or common; any kind of kiln. Address, BOX 5—ANGLAIS,
5 1 cm Care Clay-Worker.

WANTED.

Position in brick works, 20 years' manager of large works in England. Expert in continuous kilns.

H. WEBSTER,
1206 Sheel St.,
5 1 cm Belleville, Ill.

WANTED.

A capable, energetic superintendent for Illinois seven-kiln drain tile plant. Must be familiar with burning shale. Advise as to experience, give references and state salary. Address

BOX 5—ILLINOIS,
5 1 d Care Clay-Worker.

POSITION WANTED.

Sales engineer, thirty-five years, with ten years' experience in refractory material for gas works—smelters—glass works and general industrial furnaces, first-class estimator, seeking position, reasonable salary. Address

BOX 5—CARL,
5 1 cm Care Clay-Worker.

WANTED.

Experienced yard foreman for a face and paving brick plant in central Pennsylvania. Must be fully qualified to take entire charge of the labor and to get results from them. In answering give full particulars as to present position, references as to past positions and salary wanted and when available. Address,

BOX 5—PENN,
5 1 d Care Clay-Worker.

WANTED.

To purchase 50 Steel Deck Drier Cars, capacity 500 to 550 standard brick. Address,

2 4 c K, Care The Clay-Worker.

WANTED.

Position as superintendent of brick plant. Am very thorough, and can handle labor satisfactorily. Best of references. Address,

E. D. STEWART, Box 55,
3 3 cm Monticello, Ark.

WANTED.

Position as superintendent of paving brick or brick and tile plant by a practical man of many years' experience from clay pit to office. Also first-class burner, up or down-draft kilns. Best of references. Address

BOX 4-L. M. J.,
4 2 c Care Clay-Worker.

WANTED

Position as superintendent of common brick plant, either soft or stiff mud. Thoroughly understand installing, operating and repairing of boilers, engines, motors and all machinery. Also burning of up-draft and continuous kilns. Can handle men. Best of references. Address

BOX 5—A. J. C.,
5 1 cm Care Clay Worker.

WANTED.

First class electrician and machinist, one capable of taking complete charge of all the machinery in a new electrical driven face and paving brick plant, and keeping the machinery up in first-class repair. Using power line current in Crocker-Wheeler motors. Give age, salary wanted, whether married or not, references and when you can come in first letter. Permanent position all the year round to the right man.

Address, MILTON BRICK CO.,
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USED MACHINES—ATTRACTIVE PRICES.

Boyd four-mold dry press, fine order, made less than one million brick; low price for quick sale. Bargain in No. 1 Williams hammer crusher, used less than one season on soft shale.

C. H. HORTON CO.,
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WANTED—Five sand-lime brick hardening cylinders. State full particulars in first letter, giving location, size, condition, price, etc. Address,

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5 2 cm Care Clay-Worker.

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MACKINAC
DETROIT, CLEVELAND BUFFALO. NIAGARA FALLS.
TOLEDO, PT. HURON, ALPENA, ST. IGNACE.

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Daily service between Detroit and Buffalo and Detroit and Cleveland. Delightful day trips during July and August, also two boats out of Detroit and Cleveland every Saturday and Sunday nights during these two months. FOUR TRIPS WEEKLY FROM TOLEDO AND DETROIT TO MACKINAC ISLAND AND WAY PORTS—June 25th to Sept. 10th, SPECIAL STEAMER CLEVELAND TO MACKINAC ISLAND. TWO TRIPS WEEKLY. NO STOPS ENROUTE EXCEPT AT DETROIT EVERY TRIP. Daily service between Toledo and Put-in-Bay, June 10th to Sept. 10th.

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A. A. SCHANTZ, Vice-Pres. & Genl. Mgr.
Central Standard Time.

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LYNCHBURG, VA.

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Brick, Lime, Magnesia, Silica & Ceramic Wares.
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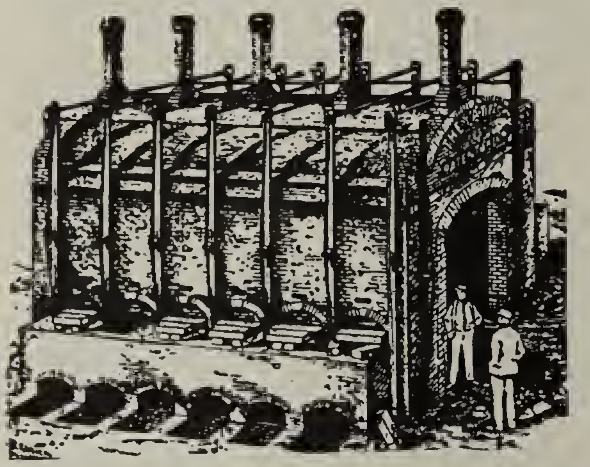

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If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

ALFRED YATES,
SHAWMUT, PA.

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(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

Plans for tunnel dryers for either the car system or the Steel Pallet and Lift Car System.

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The only perfect spiral conveyor. Continuous flight—no laps or rivets.
A Complete Line of the Best Supplies.

Belt, Chain and Cable Conveyors.

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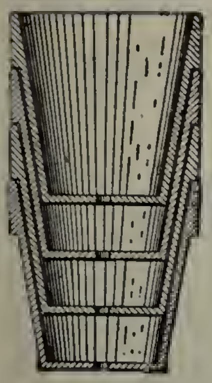

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Capacity in 10 hours:
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Write for Circular and prices.

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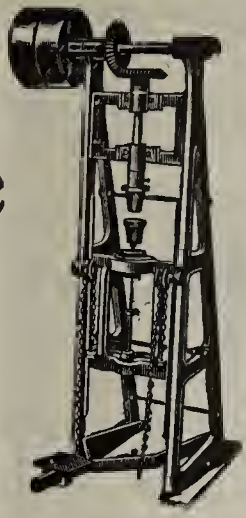

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A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

Chattanooga Paint Co.,
Chattanooga, Tenn.
Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,
Red, Brown, Buff, Black.

PHILLIPS & McLAREN CO.
PITTSBURGH, PA.

Builders of
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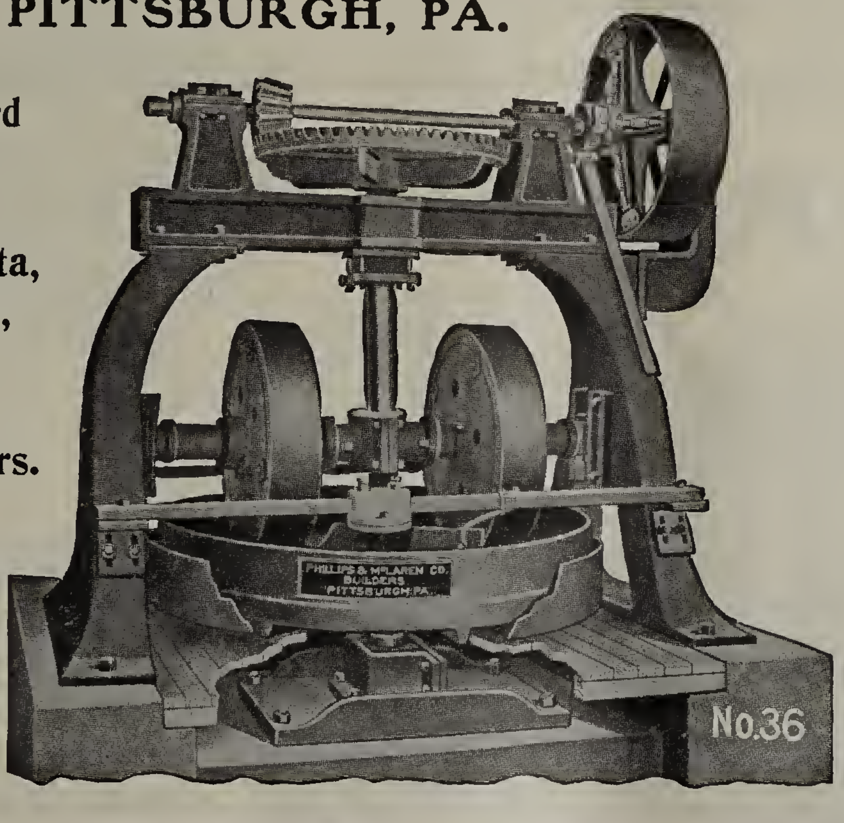
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office
Stephen Girard Bldg.
Philadelphia, Pa.



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to Sell
or Buy...

Second-hand Clayworking Machinery, Tile Mills, or anything pertaining thereto.

If...
You Want
a Man

for any position or a position in any connection with the Clayworking Trades use the

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and Want
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of...
The...
Clay-Worker.

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For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of seven words to line. Head line counts as two lines.

$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) $2.00

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Making Men Over

EVERY night we receive hundreds of tired men, worn out by a hard day in a strange city. And we make them over, and they go out next day ready for it.

Pleasant, well-ventilated, quiet rooms; good beds; courteous, gracious service; every convenience and comfort a tired man wants which a hotel can supply---these are among the good things you'll always be sure of at any Hotel Statler.

Your satisfaction guaranteed, whether you spend $1.50 or $20 a day.

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450 Rooms
450 Baths

DETROIT
800 Rooms
800 Baths

CLEVELAND
1000 Rooms
1000 Baths

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ROESSLER-HASSLACHER
CHEMICAL COMPANY
100 William Street
NEW YORK

As a Preventative of Scums Use

CARBONATE OF BARYTES

R. & H. PRECIPITATED.

Oxide Tin,
Oxide Cobalt,
Red Oxide Iron,
Green Oxide Chrome,
White Oxide Antimony,
Black Oxide Manganese, and
all Chemicals used by the Clay Trades.

THE OREGON KILN

A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

PYROMETERS

Brown Pyrometers will mean more uniform burning of your kilns, less fuel consumption, better ware. Why not install them as all progressive concerns are doing?

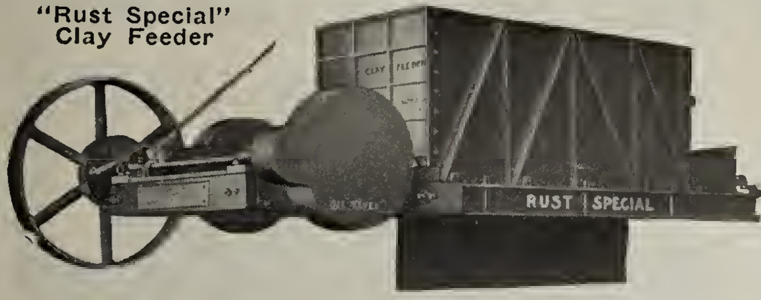
Brown Instrument Co.

Philadelphia, Pa.

New York Pittsburgh Chicago

Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special"
Clay Feeder



Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your off-bearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Soiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

The Old Way

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen, Lew Wallace, the author of "Ben Hur," wrote: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

ADDRESS THE CLAY-WORKER, INDIANAPOLIS, IND.

The New Way

Have you The Beighlee Pyrometer

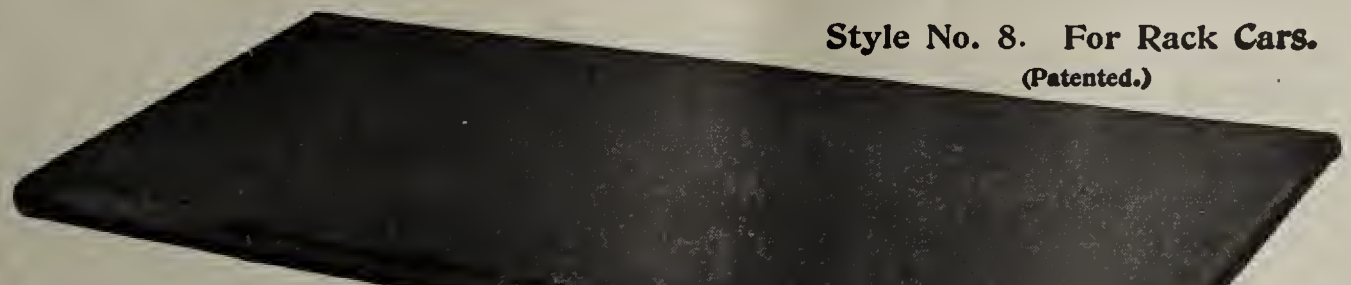
installed in your plant? If you have we **know** you are well pleased with the results you are getting.

This Beighlee multiple station recorder will give you continuous individual records of one or twelve kilns on the one chart for the entire burning period.

Can you afford to be without "The Pyrometer with a conscience."

The BEIGHLEE ELECTRIC COMPANY
Cleveland, Ohio
HERMAN A. HOLTZ, Hudson Terminal Bldg., New York City

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

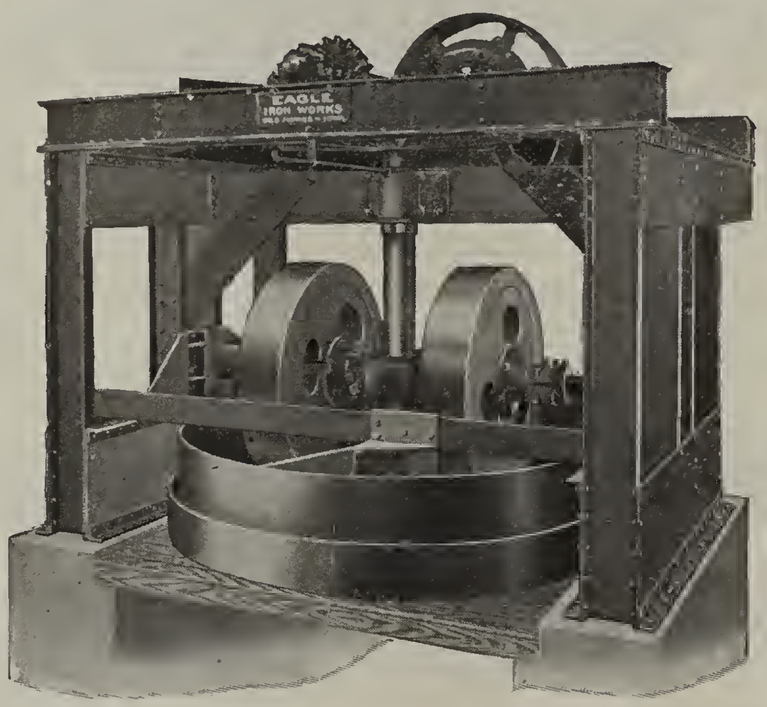


Style No. 8. For Rack Cars.
(Patented.)

Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

A New Candidate for Favor! Right in Every Way!



The 8 Foot Steel Frame Dry Pan

Built by the

EAGLE IRON WORKS

Des Moines, = Iowa

The Three Cardinal Virtues in All Brickmaking Equipment

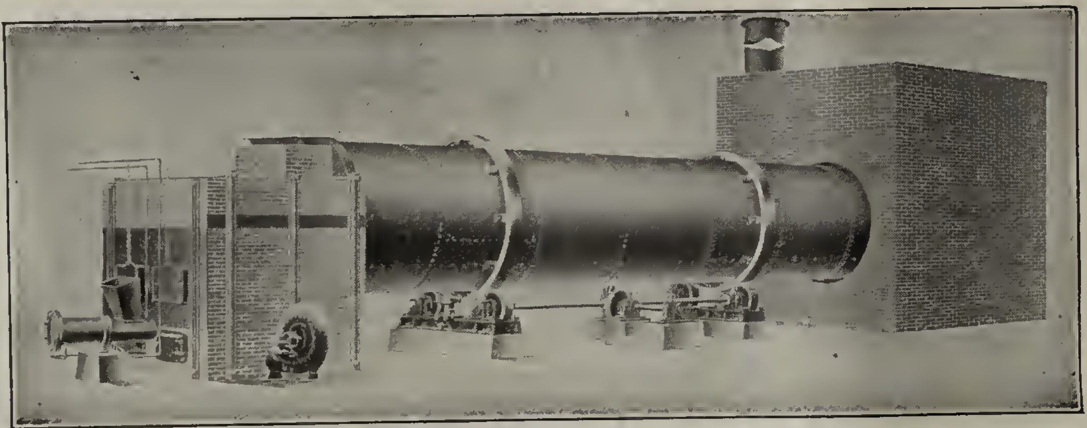
EFFICIENCY
ECONOMY
STABILITY

These you have in the highest degree in Brick Drying in

THE NATIONAL DRY KILN

INDIANAPOLIS, IND.

Write for Catalog, mentioning The Clay-Worker.



ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

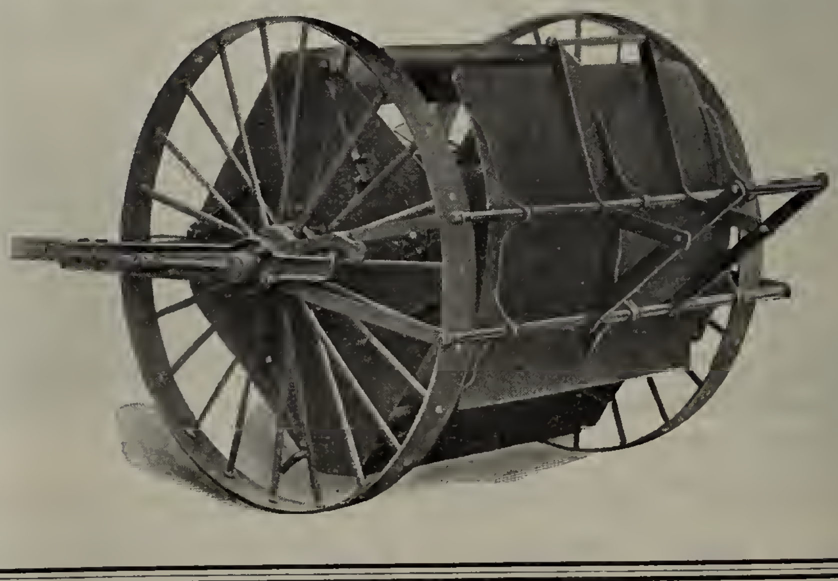
YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
NEW YORK

THE QUINCY IMPROVED GATHERER

used in connection with our SPECIAL CLAY PLOW is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
Quincy, Ill.



HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

Three Letters About Three Belts

IN 1909 we received this letter: "We are operating 3 Gandy Belts on our main drives. One belt 30 inches wide and one 27 inches wide has been running for 14 years. One belt 30 inches wide has been running for 20 years. We are pleased to state that all of these belts are doing good work."

W. J. DICKEY & SONS, Inc.
Oella Mills, Baltimore, Md.

In 1912 this letter came to us: "The three Gandy Belts about which we wrote in our letter of July 22, 1909, are still running, and are still doing satisfactory work."

W. J. DICKEY & SONS, Inc.

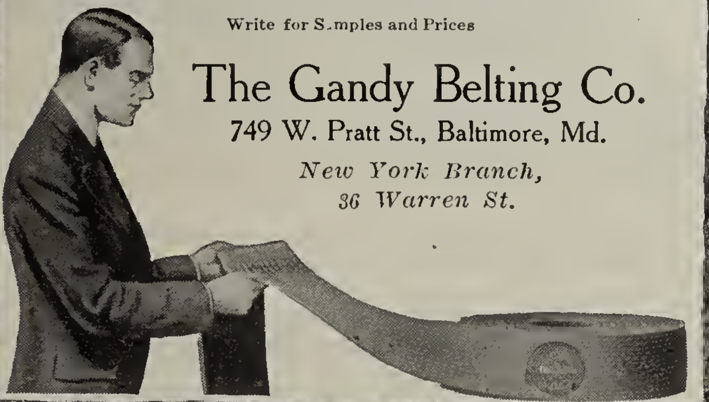
In December, 1915 came another report: "We are glad to state that the three Gandy Belts mentioned in our letter of March 25th, 1912, are still running, and prove satisfactory."

These reports--six years apart--on Gandy Belts, which had originally been running 14 and 20 years at the time the first was written.

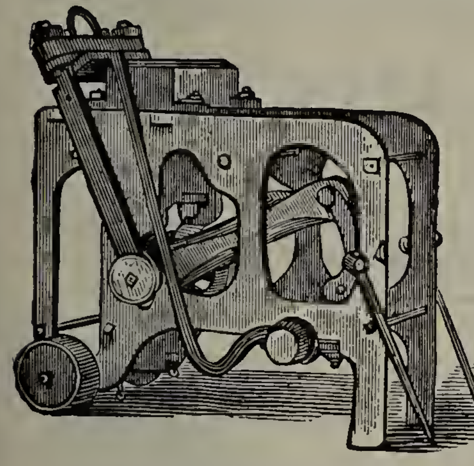
If this is the sort of belt service you would like, decide now to specify GANDY, the original stitched cotton duck belting next time you order, and be sure to get THE GANDY. Look for the Gandy trade mark.

Write for Samples and Prices

The Gandy Belting Co.
749 W. Pratt St., Baltimore, Md.
New York Branch,
36 Warren St.



GANDY

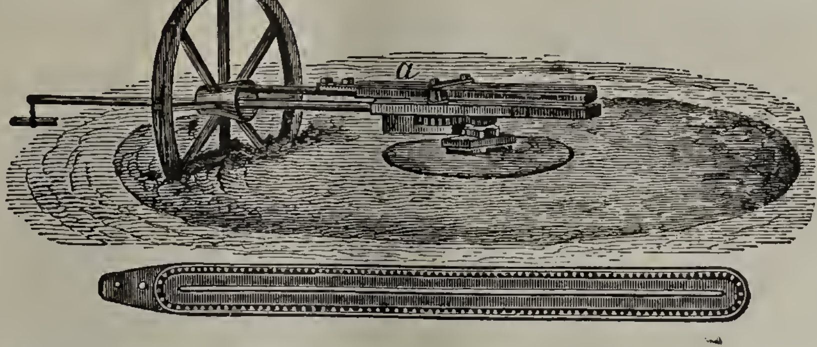


RED BRICK PRESS.

Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞ Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

DO YOU KNOW

that in the BURNING OF BRICK a DRAFT GAGE is of greater advantage than a PYROMETER? We furnish both.

DO YOU KNOW

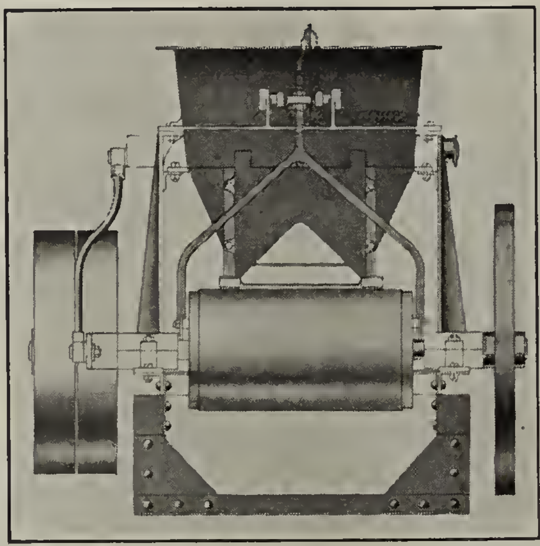
that for many years we have made the BEST DRAFT GAGES for all styles of kilns?

Write us for information of all kinds of controlling apparatus for clayworkers.

Ceramic Supply & Construction Co., Columbus, Ohio

The Schaffer Poidometer

PATENTED



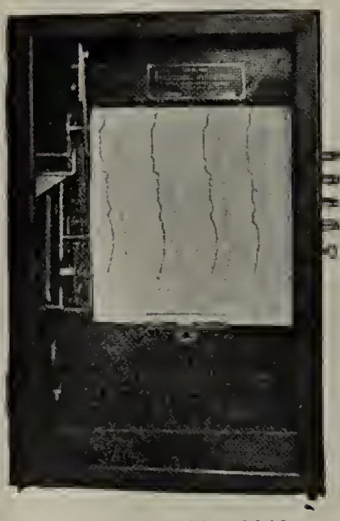
The Poidometers automatically temper the clay. They unite any number of materials in correct proportions. They weigh the materials, measure the water and deliver them in a predetermined quantity per minute in an even, constant flow.

They cause a uniform column of clay to flow from the brick machine at a regular speed.

INVESTIGATE AND
INVEST IN THESE MACHINES.
IT WILL PAY YOU.

The Schaffer Engineering & Equipment Co.
Tiffin, Ohio

The More Knowledge; The BETTER RESULTS



Catalog No. 3242
Eight Records on One Chart

It is obvious that the more you know about firing conditions in your

KILNS

the better you can control the burning of your product. It follows, therefore, that the pyrometer outfit which will enable you to secure the most information for the money is the most economical outfit to purchase.

TRADE MARK TWINKO THWING INSTRUMENT COMPANY

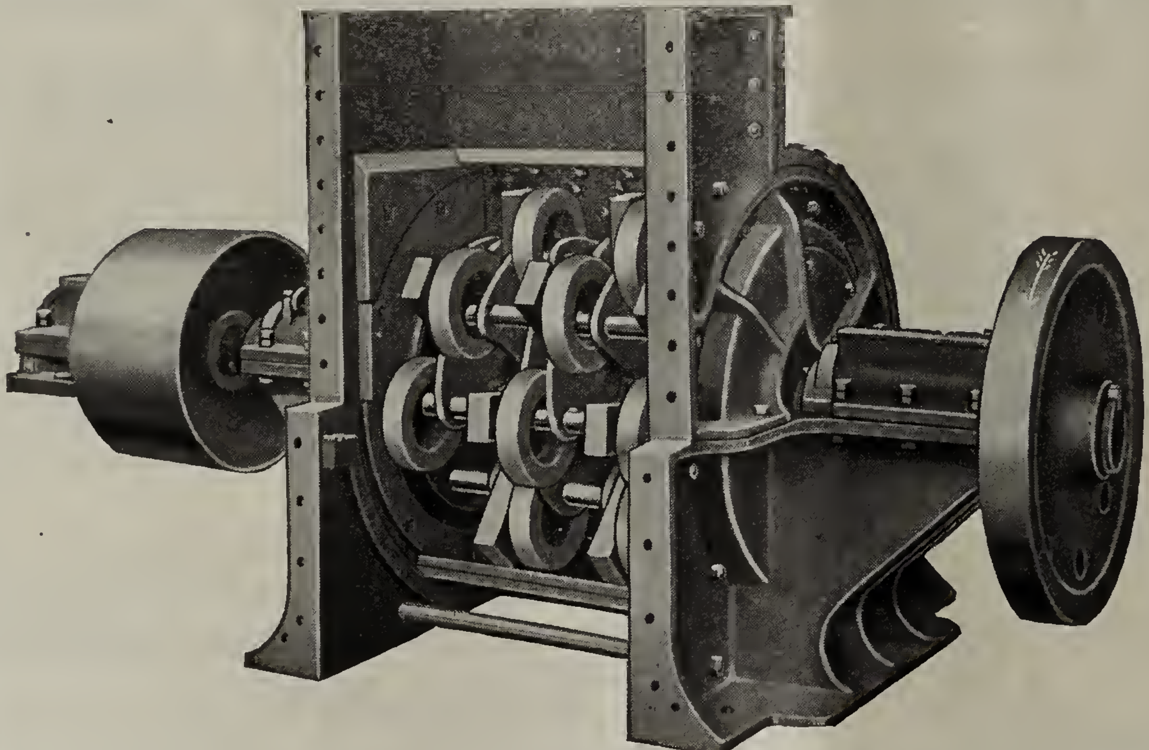
Multiple Record Recording Pyrometers

permit the recording of more data from more points in one kiln, or from a larger number of kilns, on a single record chart than any other make of pyrometers.

That is why they are being so universally adopted.

Tell us how many kilns you fire at one time, and we will submit a proposition that will delight you.

Thwing Instrument Company
439 N. 5th St. Philadelphia, Pa.



The MACHINE

that has

POWER to PRODUCE

and will pulverize Shale or Shale and Clay, Brickbats, Coal, Coke, Marl, Kaolin, Sandstone, Burnt Lime, Fire Clay, etc.

Are You in Need of a

MACHINE

that can pulverize **18 or 25 Tons of Shale and Clay per hour** and save 50 per cent installation cost.

Describe your material, ask for catalog, and information.

GEO. C. VIDETTO
Eastern Sales Manager
207 Fulton Building, Pittsburg, Pa.

American Pulverizer Co.
EAST ST. LOUIS, ILLINOIS

MR. CLAYBURNER

If you reduce radiation from crown and walls of kiln you save time and fuel. If you increase life of linings and prevent rust and corrosion on dryer cars, fans, pipes, etc., you save costly renewals. You can do these things with Carbide Coating at a nominal cost.

You may not believe that a coating or paint will protect linings. You, however, believe that salt glaze or a vitrified surface protects pipe and brick. Well, the pigment in Carbide Coating will endure heat that will burn up, vaporize fire brick and the vehicle or binder is the same article you get in salt glazing at the vitrifying temperature. The combination forms a composition which will protect linings, reduce radiation and protect metal from acid, sulphur and other corrosive fumes.

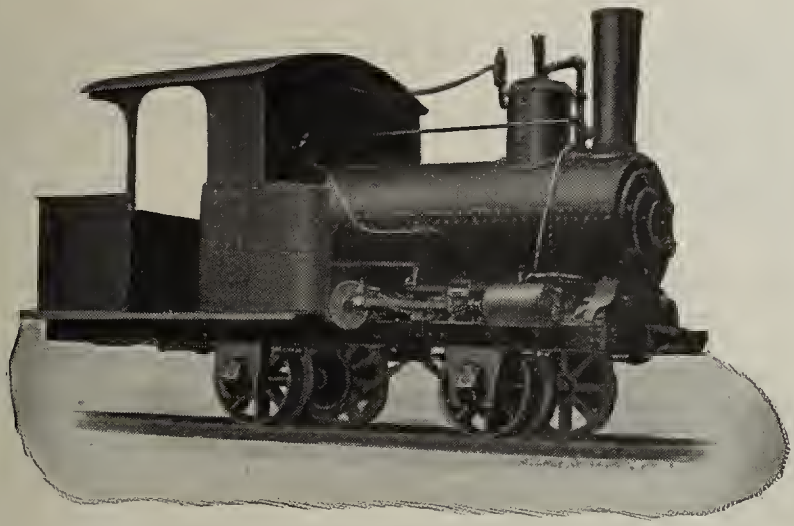
I will be very glad to show you how you can use this to advantage. Address,

E. R. STOWELL,
Oden, Mich.

INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

TYPE 0 THEW Loads Clay for 264,000,000 Brick in 9 Years
TYPE 3 THEW Loads Clay for 397,500,000 Brick in 15 Years

The above mentioned THEW is now loading clay for 120,000 brick per day, 300 days per year at the "F" Plant of The Farr Brick Company, Cleveland, Ohio.

The type 3 referred to is now loading clay for 150,000 brick every day at the "G" Plant of the same company.

A TYPE 1 THEW, IN ITS ELEVENTH YEAR OF CONTINUOUS SERVICE in one of the plants of The Barkwill Brick Company, Cleveland, O., LOADED CLAY for 31,000,000 BRICK in 1915. The engineer reports that they were SHUT DOWN BUT ONE HALF DAY during that time.

Over 300 brick manufacturers, in all parts of the country, are sending in similar testimony daily,

No wonder the owner wrote, after nearly 25 years of service, as follows: "Our shovel is not very handsome to look at but it does its work without any trouble. I can't say anything too good for the shovel or the Thew Company." This shovel is shown in the cut.

There are certain fundamental principles in the Thew design that account for this ability to give maximum and continuous service at a minimum maintenance cost.

BUY a THEW and FREE YOURSELF from LABOR TROUBLES and the reduced output incident thereto.

WRITE FOR CIRCULAR 22-F AND LIST OF THEW OWNERS

THE THEW AUTOMATIC SHOVEL CO.
LORAIN, OHIO

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Land Drainage, by J. L. Parsons. Price, $1.50.

A treatise on the design and construction of open and closed drains.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

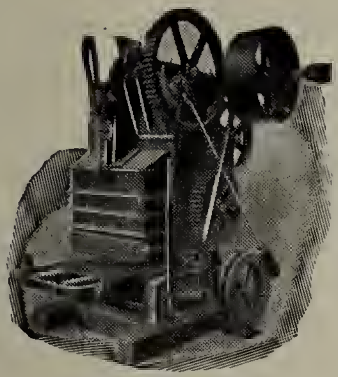
Drying Brick, by W. D. Richardson. Price 25 Cents.

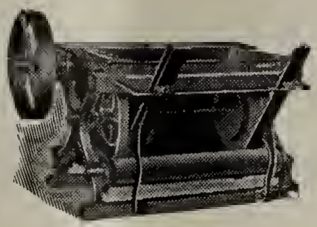
A little booklet giving and explaining the various styles of dryers, etc.

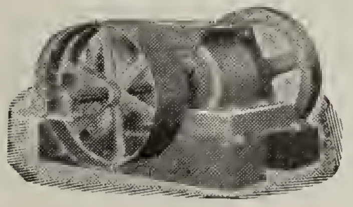
T. A. RANDALL & CO.

Indianapolis, Ind., U. S. A.

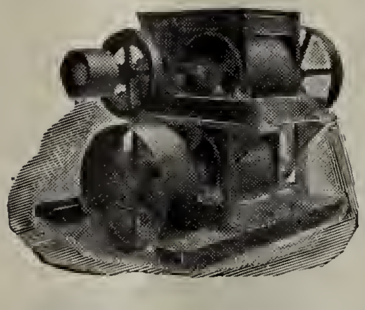
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

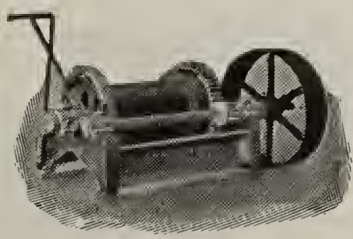

Vertical Brick Machine

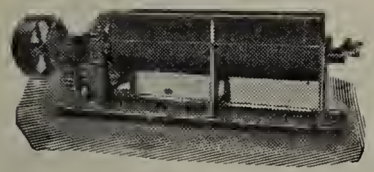

Style "A" Mould Sander

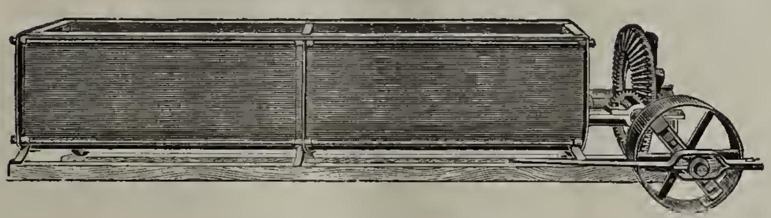

Style "P" Roller-Crusher

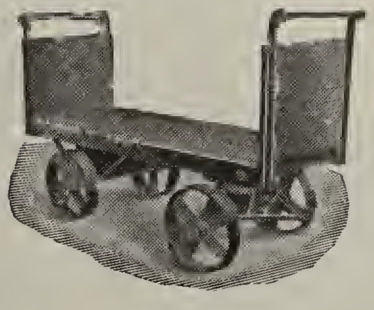
Style "A" and "P" Disintegrator

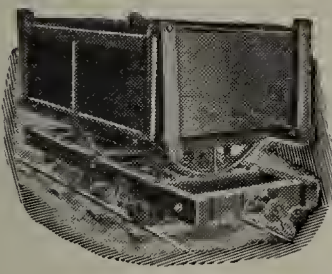

Style "P" Compound Disintegrator and Crusher

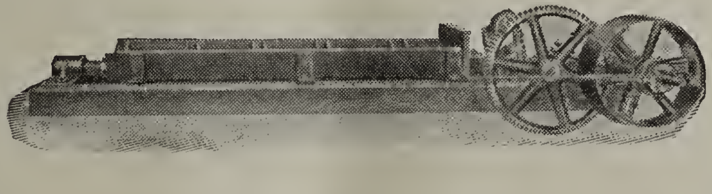

Style "B" Winding Drum

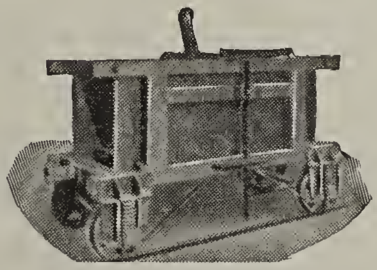

Double Geared Pug Mill

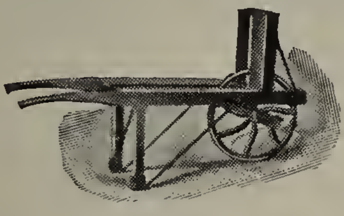

Single Geared Pug Mill


Mule Truck

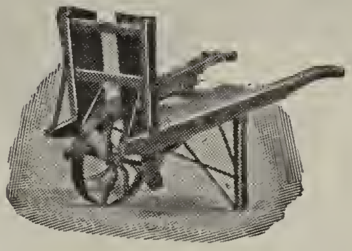

Side Dump Car

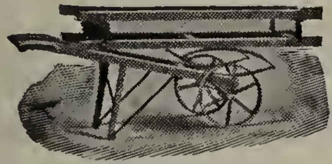

Feeder or Granulator

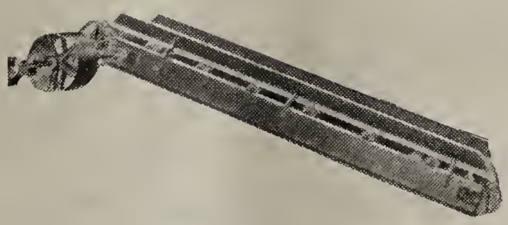

Bottom Dump Car

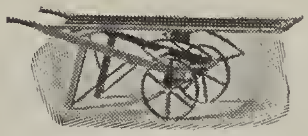

No. 6 Barrow

The Potts Rocker Grate
For any size fire box on boiler or kilns


No. 2 Barrow


Double Deck Truck


Clay Elevator.


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

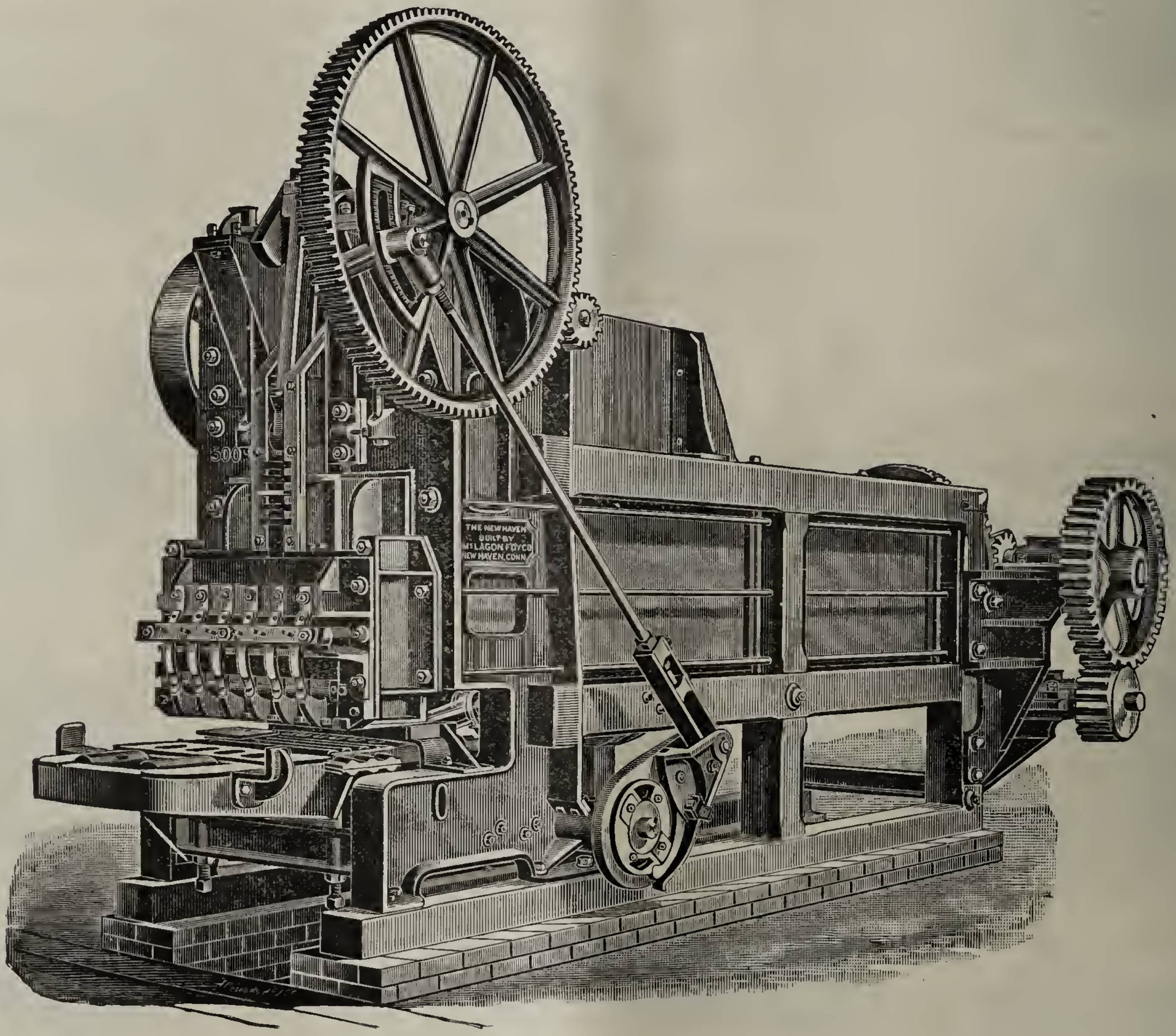
Write us for Prices.

If it's to be Had We Have it.

Soft Mud Brick Machines

Are the only kind we build and we build them well. We build them with the greatest strength placed where it is the most required. We build them with stout shafts, long bearings, large oil holes, strong gears, steel liners, and all other details in proportion. We build them so they

DO NOT BREAK DOWN EVERY DAY.



"NEW HAVEN" HORIZONTAL BRICK MACHINE.

NEW HAVEN BRICK MACHINES

are popular at home because of their superior qualities. More than three-fourths of the brick made in New England are the product of ***New Haven*** machines. For hard service they are sure to satisfy where others fail. That is the reason why each New Haven Machine is a standing advertisement, and why all users recommend them.

The EASTERN MACHINERY CO.

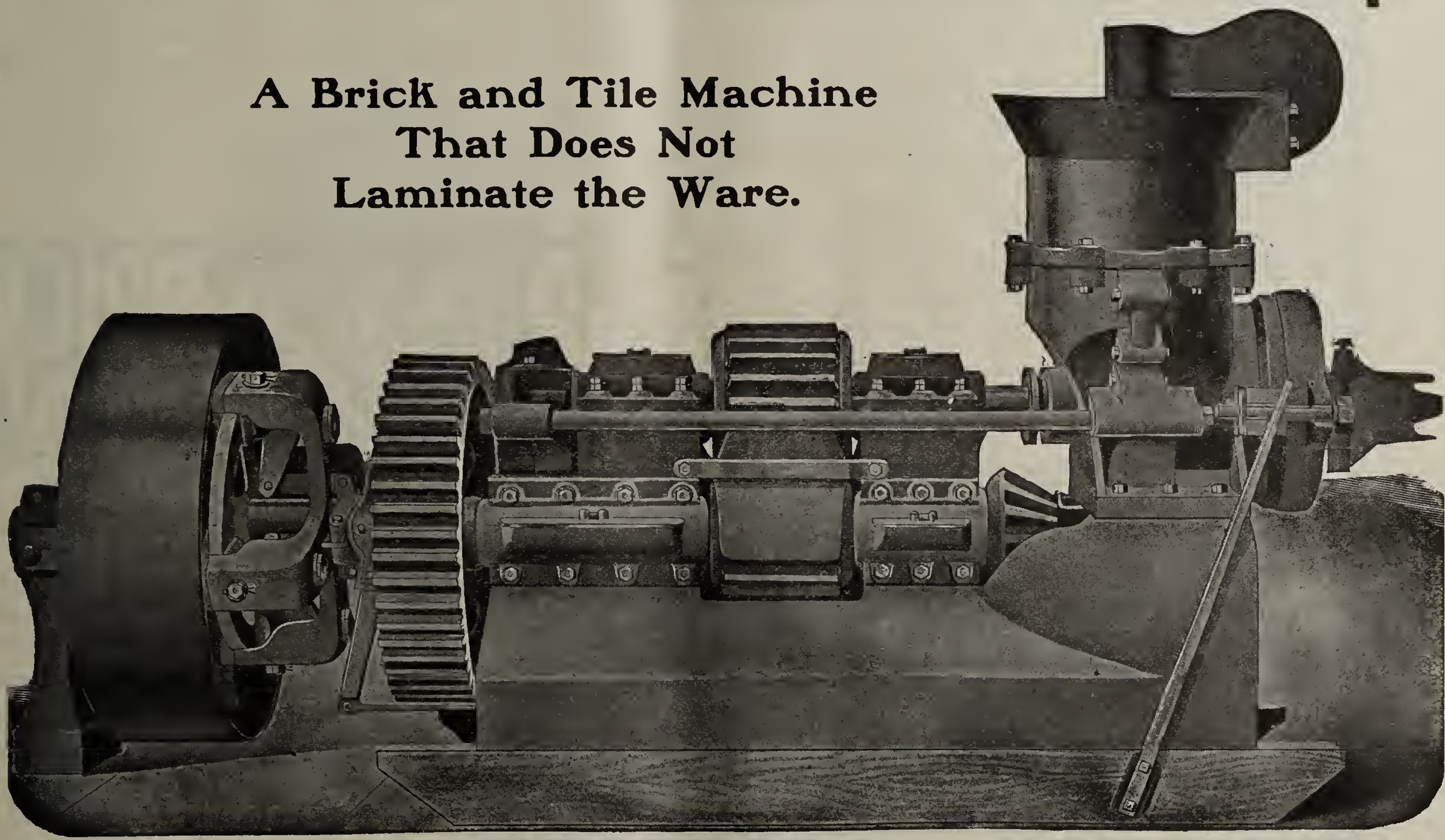
NEW HAVEN, CONN.

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

**A Brick and Tile Machine
That Does Not
Laminate the Ware.**



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

THE WALLACE MFG. CO.

FRANKFORT, IND.

JOIN THE

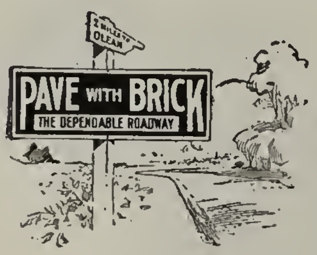
BOOST **BOOST**

BUILD WITH BRICK

CAMPAIGN

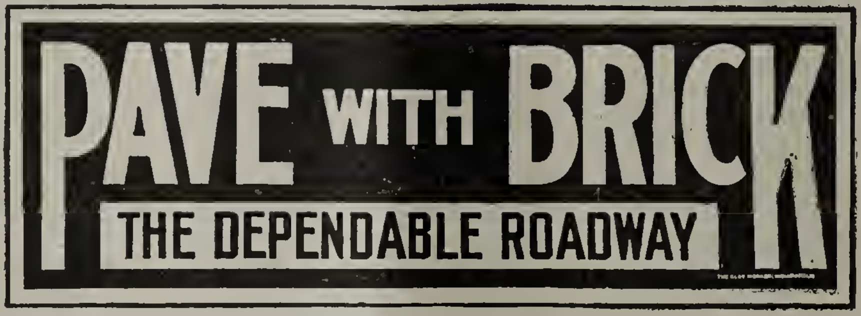
A Movement Worthy of Your Support. It Increases the Demand
for Burned Clay Products, Helps to Decrease the Cut Price
Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.

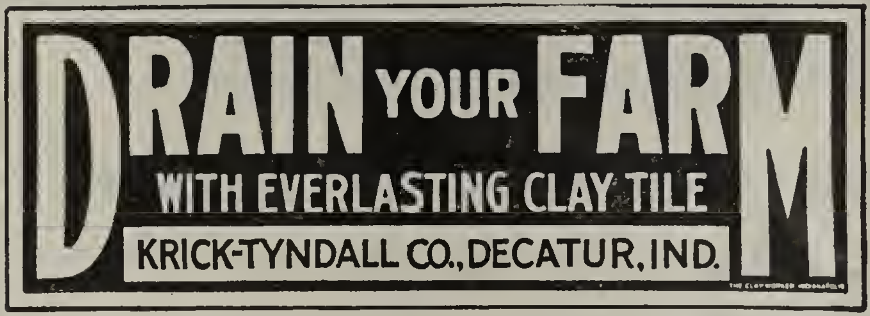


IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

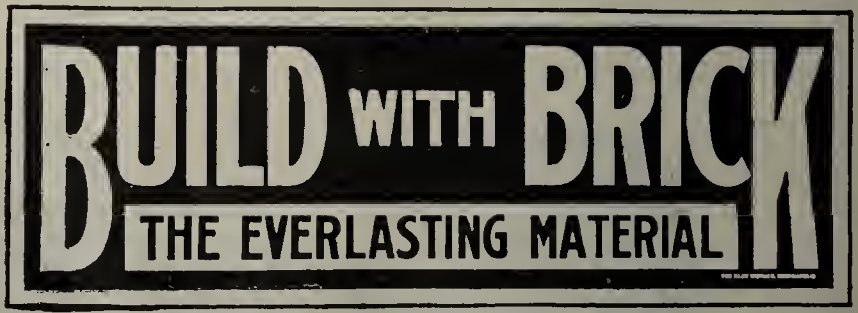
Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.



It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.



Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.



Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

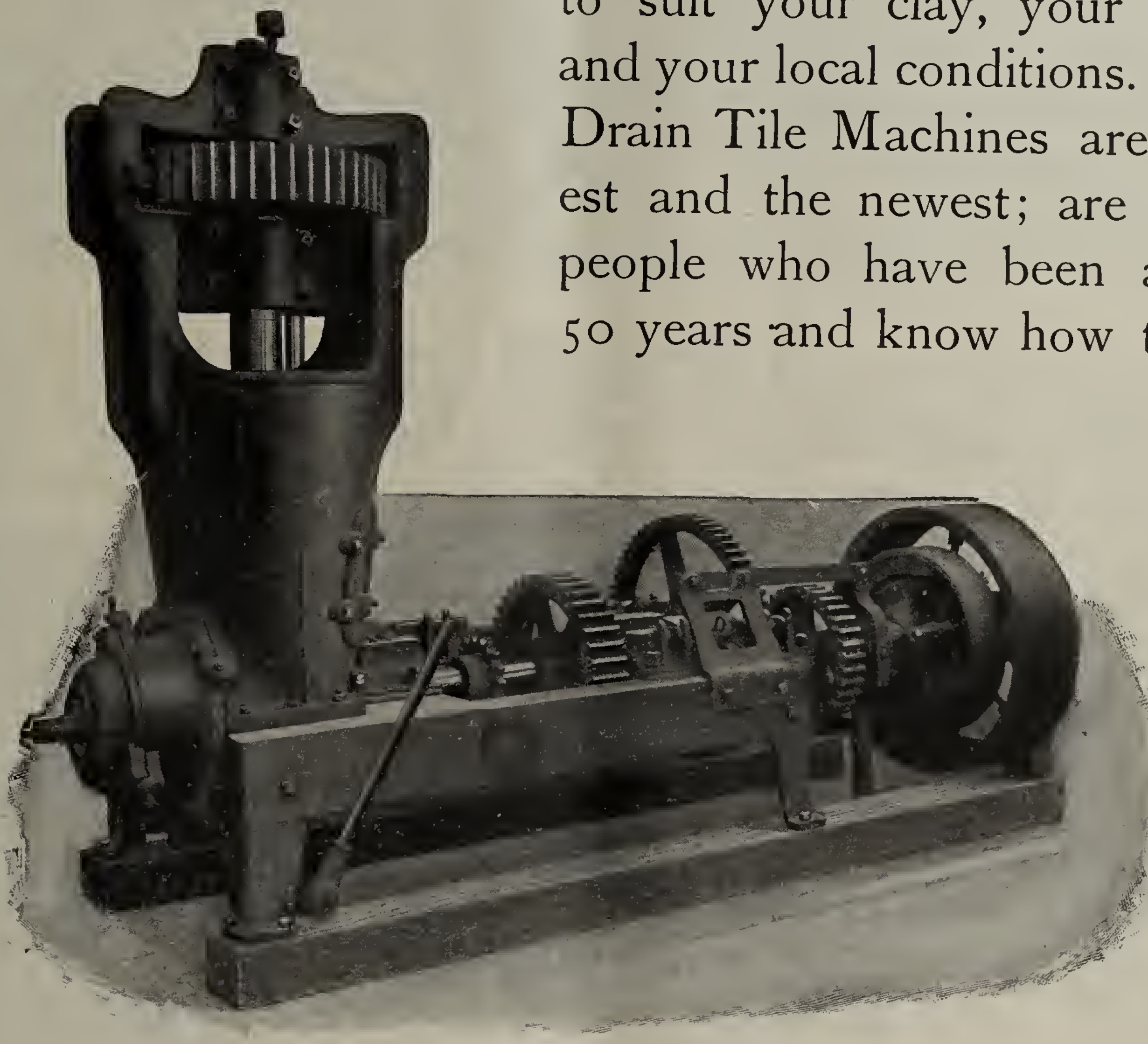
....

(Cross out the items not wanted, fill in and mail us the coupon.)

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

DRAIN TILE MACHINES

We build and guarantee both upright and horizontal patterns in several sizes, and can furnish you with just the proper machine to suit your clay, your methods and your local conditions. Brewer Drain Tile Machines are the oldest and the newest; are built by people who have been at it for 50 years and know how to do it.



We also build Horizontal Brick Machines, Automatic Cutters, Crushers, Pug Mills, Feeders, Dry Pans and a full line of stiff-mud machines.

ASK FOR COMPLETE CATALOG.

H. BREWER & COMPANY, Tecumseh, Mich.

? ? ? ?

The Eternal Question of Brick Drying is Constantly Before the Clayworker Who is Not Equipped to Handle this Process in an Efficient Manner

Your customer demands product and you require production from your operating department. Every brick spoiled at any place during the process of its manufacture is a dead loss to you of all the labor and material put into it. At the drying operation this amounts to about 50% of its value. This is also a production loss. Your crew has to take the time and material to make others in order to complete the days run.

So then it behooves the careful manufacturer to furnish his producing department with equipment fully up to the highest standard of efficiency. There should be no losses in the dryer. If your dryer is properly designed and handled, and your material will stand any reasonable amount of heat and air, there will be no losses.

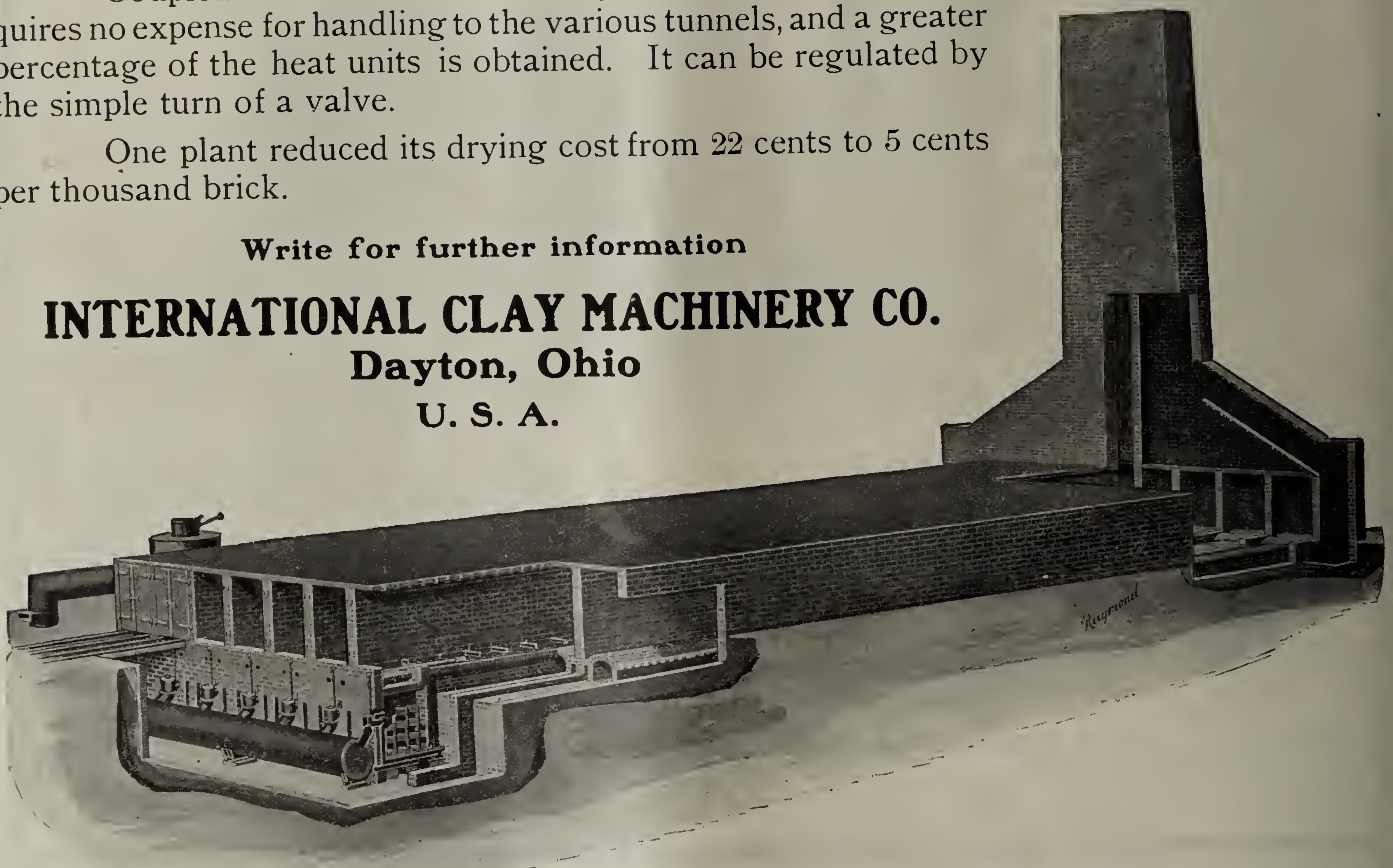
We can furnish you with a dryer, properly designed to meet your individual needs, one which will handle the tenderest clays with the greatest of care, or can be rushed to the full limits of its heat and circulation.

Coupled with this is the economy of operation. Producer Gas is the fuel. It requires no expense for handling to the various tunnels, and a greater percentage of the heat units is obtained. It can be regulated by the simple turn of a valve.

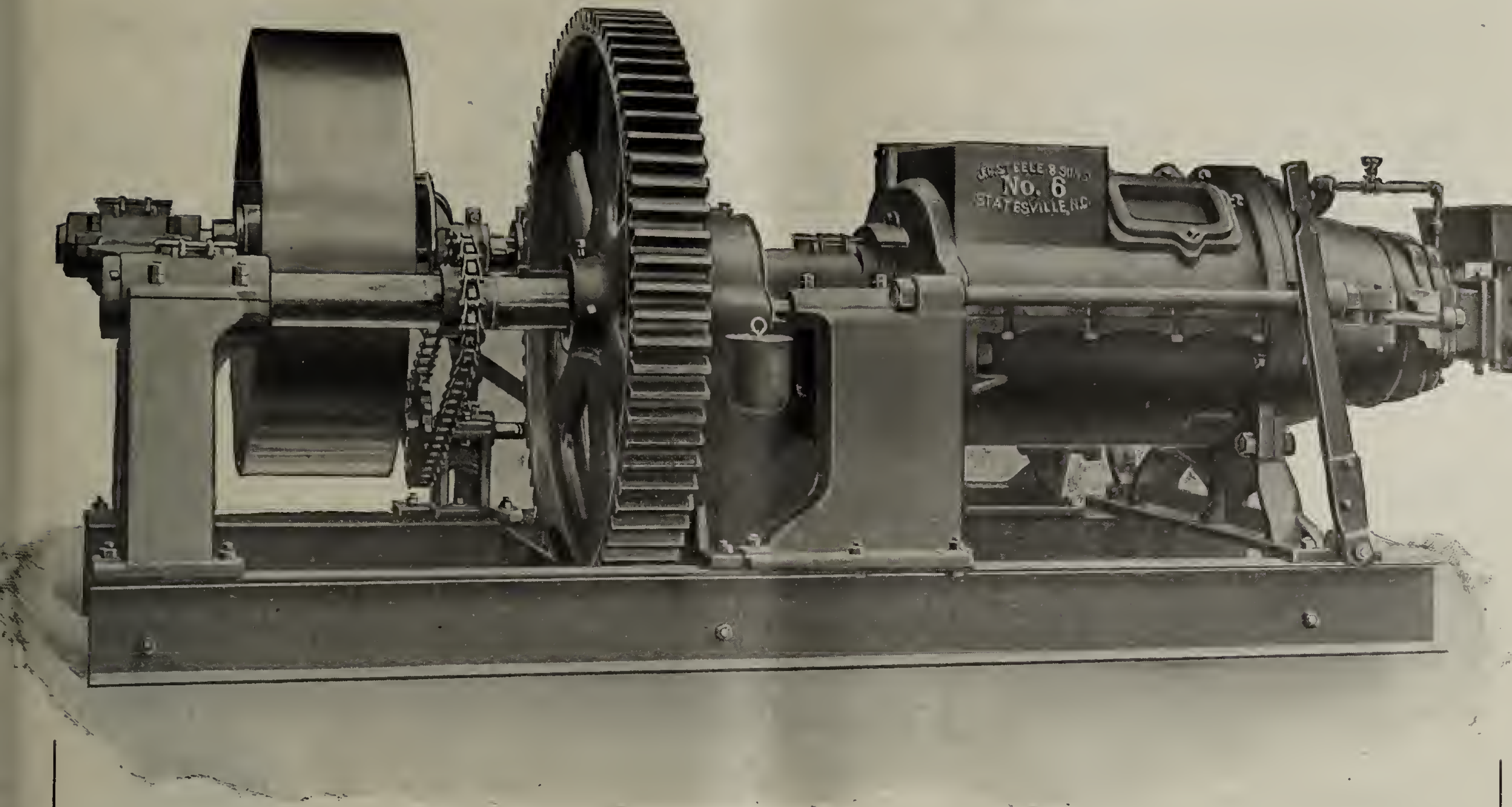
One plant reduced its drying cost from 22 cents to 5 cents per thousand brick.

Write for further information

INTERNATIONAL CLAY MACHINERY CO.
Dayton, Ohio
U. S. A.



Producer Gas Fired Metallic Radiation Dryer



(HOUSING REMOVED)

No. 6 Brick Machine, Capacity 50,000 to 150,000

A brick machine of largest capacity with single gear driving mechanism of new and improved design.

Tested for hours at a speed of 45 revolutions per minute of the auger shaft. Remember, engine speed and auger shaft speed are fixed speeds, and the less transmitting appliances between them, the less power required.

This machine has only two gears and four bearings—a reduction of three bearings, two gears and one shaft, as compared with most machines of large size.

The bearings are very large—from 4½ in. x 15 in. to 9 in. x 18 in.

The friction clutch pulley runs loose on a 7⅝ in. x 18 in. bearing.

The gear is very large, thereby reducing tooth load and side strain on bearings to a minimum; therefore reducing power required, wear and tear to a minimum.

Gears are cut, pinion being steel. Housed and run in oil bath.

Thrust bearing of most approved design, in front of gear; less than half frame. Outer end of auger shaft supported on out-board stand, thereby getting distance between bearings, and again reducing side strain and friction.

Sills are very heavy "I" beams with heavy channel for side strain.

Machine can be taken to pieces without elevating any part; will run equally well in either direction.

Cutter driving mechanism entirely separated from more important wearing parts, and get any speed in either direction.

Standard auger shaft for brick made of steel, 9½ in. in diameter, with inserted adjustable steel knives, and renewable wearing surface or shell. Also equipped with a system of continuous augers and bushings, telescoping mouthpiece, etc., for any kind of hollow ware. In this case, the shell is left off and knives fit over shaft.

A close examination will reveal many interesting points that we have not space to mention.

For further information address

J. C. STEELE & SONS

STATESVILLE, N. C.

Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

Automat

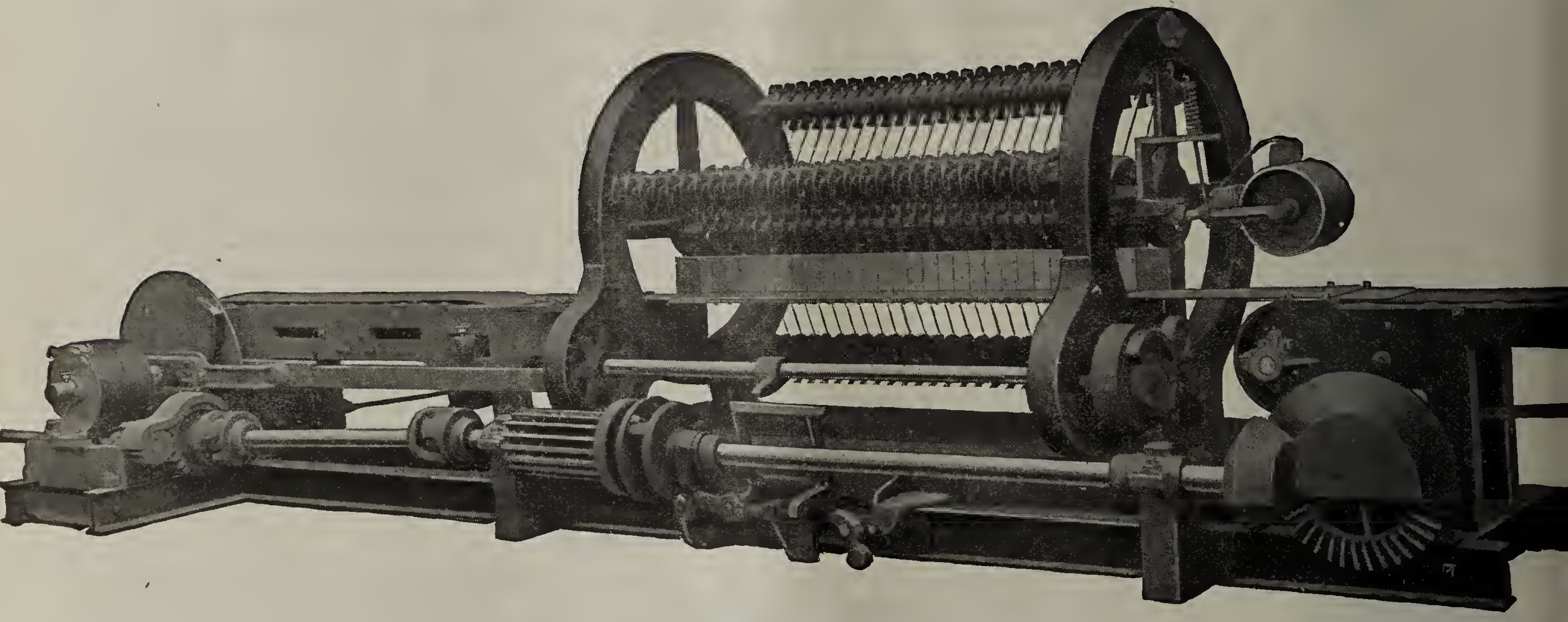
OR

Acrobat?

Positive clutch, mechanically controlled carriage movement, no segment gears or slipping belts—**An Automatic Cutter.**

Slipping belts, friction clutches, segment gears, slipping parts—**An Acrobatic Cutter.**

Which is most satisfactory—NATURALLY?



Model C 30 Rotating Automatic Cutter

A postitive sure-acting automatic cutter giving perfect satisfaction in several hundred plants.

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For
Sixty-Three
Years
The Name

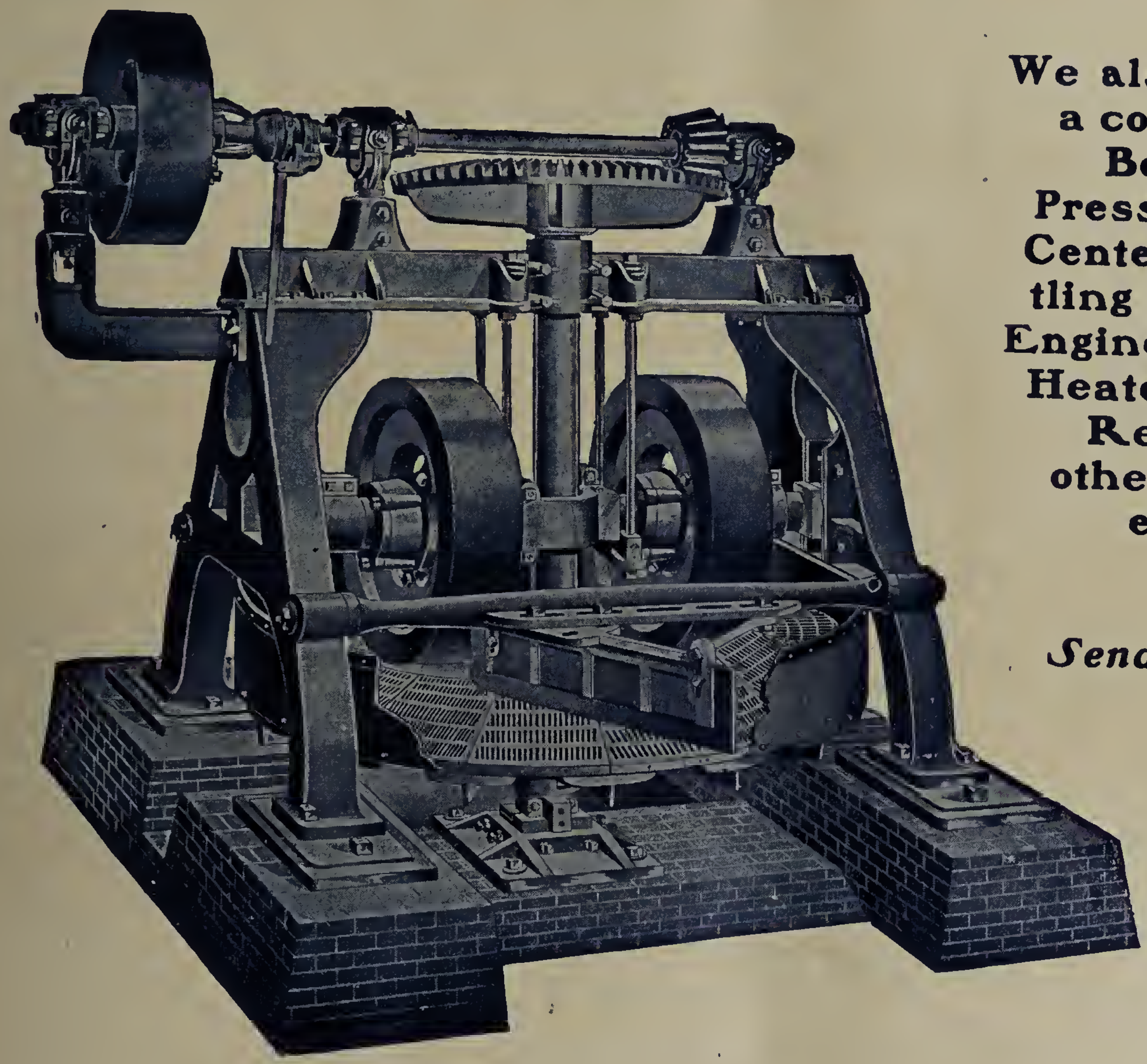
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



We also manufacture a complete line of Boilers for all Pressures, Side and Center Crank Throttling and Automatic Engines, Feed Water Heaters, Tanks, Air Receivers and other power plant equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.

The Wise Man of FATE

Fate is Going to Announce a New Device

Shortly we are to make known to the clay-working world a new device—an addition to one of the Fate machines that adds still greater efficiency to what has been considered a perfect contrivance.

This New Device Revolutionizes Hollow Block Making

It cuts down labor cost by eliminating men at the off-bearing end of the auger—it automatically does what men now are forced to do by hand—it gives a greatly improved product.

The Announcement Will Be Made In This Paper In June

In this announcement a picture of the new device will be shown as it is actually working in the plant of a well-known clayworker, and a full description will be given, with some data that will cause all hollow block manufacturers to sit up and take notice.

In the Meantime---If you Are Interested and Cannot Wait---

Write in to us and we will give you some advance information—if you will just mention this announcement.

At the same time—if you want information about any of the other Fate machines or devices, check off the list at the left.

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

☐ Auger Brick Machinery.
☐ Hollow Ware Machinery.
☐ Conveyors.
☐ Crushers.
☐ Elevators.
☐ Clay Feeders.
☐ Disintegrators.
☐ Pug Mills.
☐ Clay Testing.
☐ Full Equipment.
☐ Industrial Locomotives.
☐ Drain Tile Machinery.

Name ....

Town.................................. State..........

← USE COUPON

The J. D. Fate Company

242 Riggs Avenue
PLYMOUTH, OHIO

Fredonia Brick Co. Hauls 100,000 Brick at a Cost of $2.85

The Wise Man of FATE

The Fredonia Brick Co., of Fredonia, Kan., is hauling 100,000 green brick on an 800-foot haul and doing it at a cost of only $2.85 per day—which is cheaper than a steam hoist could do it.

It Is Done With

THE PLYMOUTH

Gasoline Locomotive

This is possible because the PLYMOUTH eliminates useless labor, runs cheaper than steam and does away with a lot of other cost items.

Read What Fredonia Brick Company Says:

The following letter from the Fredonia Brick Co., gives some exact cost figures on the Plymouth:

"We have a haul of 800 feet and the Plymouth has a daily duty of 100,000 six and a half pound green brick in a day of ten hours.

"It costs us $1.75 per day for an ordinary day laborer to run the locomotive, 90 cents for the six gallons of gasoline required, and 20 cents for the half gallon of lubricant.

The Plymouth at the Shale Bank of The Fredonia Company

"This is considerably cheaper than our former methods, we getting a cost reduction in labor, fuel and per ton mile."

The Plymouth Can Do the Same for You

If THE PLYMOUTH can do this for the Fredonia Brick Company, it looks reasonable to suppose it can also for YOU. Why not investigate, at any rate, and prove it to your own satisfaction—since it costs nothing to investigate?

GET BOOK OF FACTS

We have a booklet that gives complete cost data on scores of Plymouth locomotives in actual use n clay plants and elsewhere. You should have a copy to compare with the cost of your haulage. Use coupon at the right and get your copy free.

The J. D. Fate Company

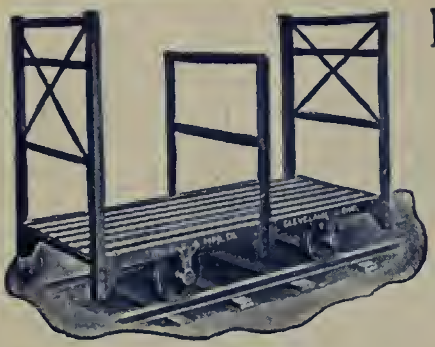
242 Riggs Avenue
PLYMOUTH. OHIO

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

Firm Name (Firms) ....
(Signed by) ....
(City) ....
(Street) ....
(State) ....

Mention The Clay-Worker.

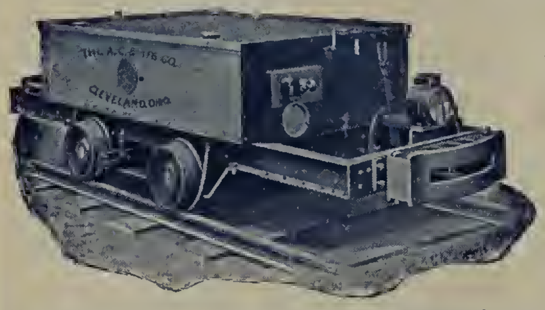


REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

ATLAS
High Efficiency
Cars and
Electric Locomotives

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.



will meet your requirements. Let us send you catalogue and quote prices.

Storage Battery Locomotive for general use.

THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information

Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

Dryer Cars
Rack Cars
Dump Cars

LAKEWOOD NO. 166

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

Chicago: 506 S. Canal St.
Pittsburgh: 1230 Fulton Bldg.
New York: 30 Church St., Room 802.
Baltimore: Munsey Bldg.
Kansas City: N. Y. Life Bldg.

JUNE, 1916

THE CLAY-WORKER

A Group of Cottages in the Brick Built Village of Bournville, England. See page 669.

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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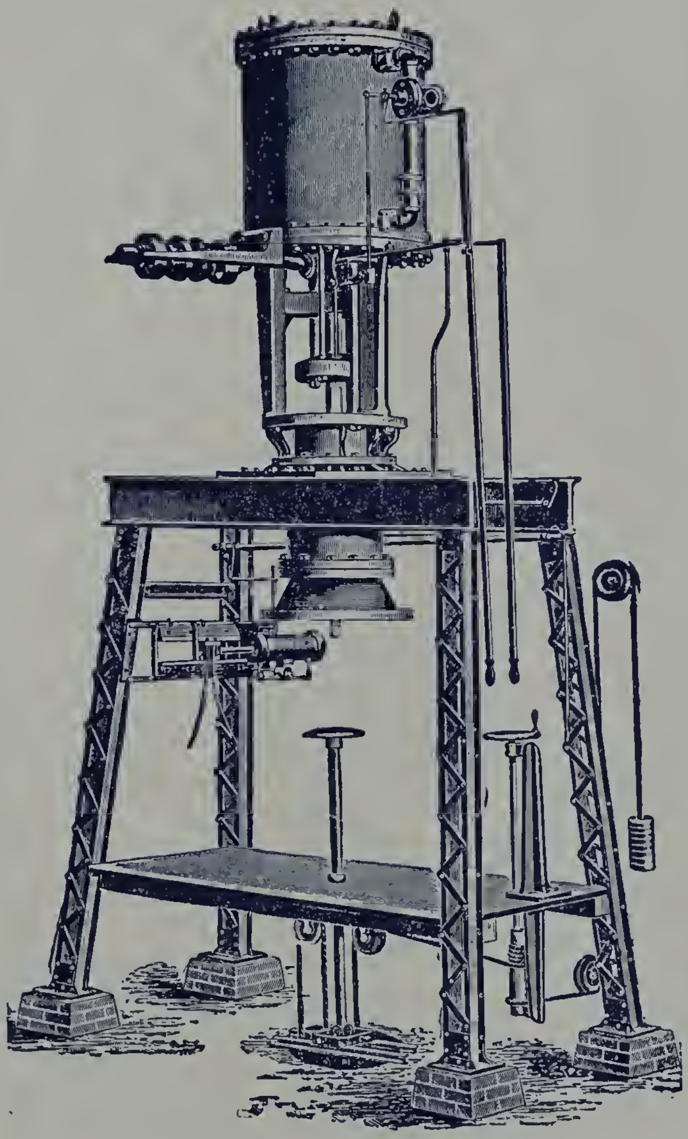
BUYERS' READY REFERENCE LIST
Pages 655, 657, 659, 660

INDEX TO ADS
Page 729

All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.

ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC.



Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.

We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

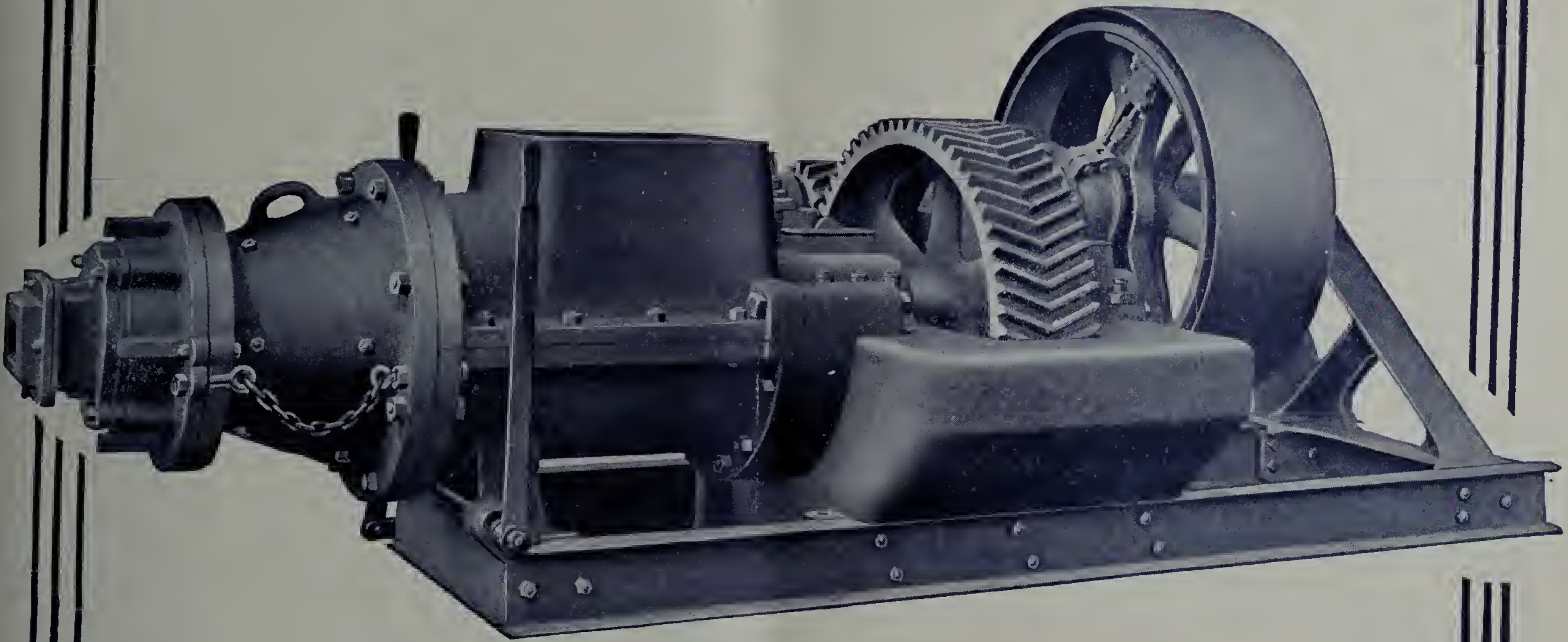
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



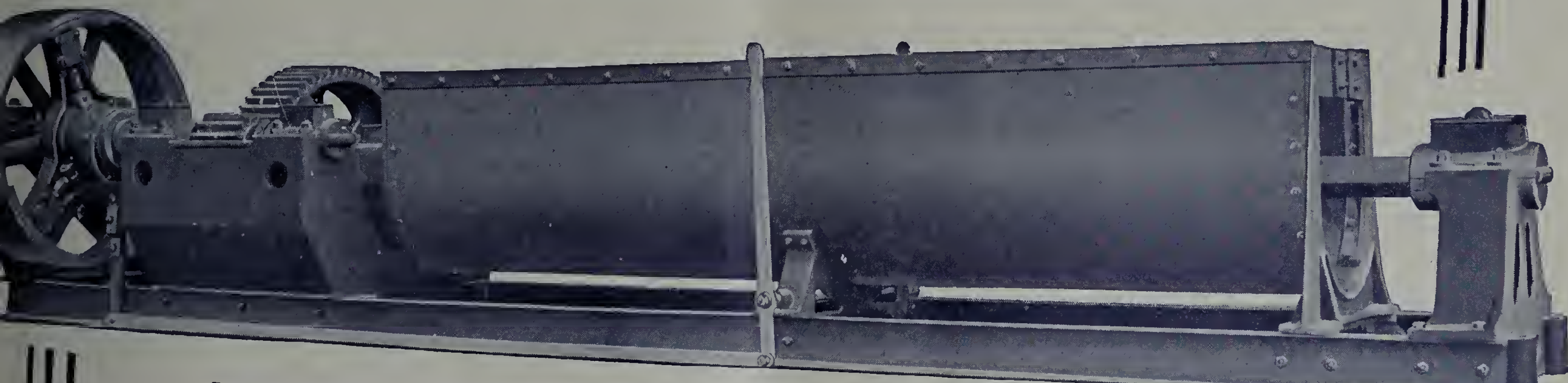
THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.



THE BONNOT COMPANY

CANTON, OHIO

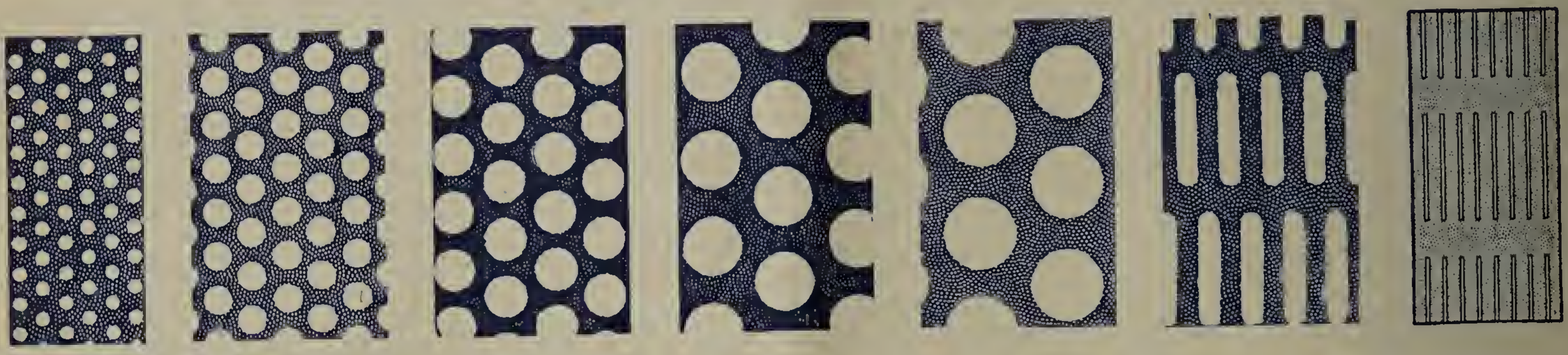
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

"No Wheelers Wanted" at this Plant for Loading Cars.

The rush season has no terrors for the Cuyahoga Brick & Shale Co. (Cleveland, Ohio.) The photograph at the left shows how they have beaten the "wheeling" game with a system of Mathews Gravity Brick Conveyers. A steady stream of brick flows steadily from kilns into cars in any kind of weather and with any kind of help.

This method enables you to roll your brick by gravity on a slight down grade, with no waste of time or labor to pay for, no damaged brick to discard, no expensive pay roll to take care of, and no fear of not being able to get your brick loaded promptly at all times.

Many large brick manufacturers have become users of the Mathews system this year. Hundreds of others have employed the gravity method for many years and could not be induced to discard it for any other method. We can supply prospective purchasers with plenty of references if desired.

Made entirely of steel, equipped with ball bearing rollers, assembled in portable units fitted with universal couplings. Curves of any desired angle can be supplied to deliver the brick to any required destination. Will last for years with very little upkeep expense.

Our representative will visit your plant, lay out a system to fit your requirements, tell you what it will cost, and take your order, all without extra cost. This service will not obligate you to buy if our proposition does not prove attractive. We can send you literature, but valuable time will be saved by requesting representative to call.

MATHEWS GRAVITY CARRIER CO.

Branch Factories:
TORONTO, ONT.
LONDON, ENG.

ELLWOOD CITY, PA.

RODGERS

Carry Rodgers Insurance

Protects Against Loss of Product in Drying.

One Premium Only---Paid at Time of Purchase.

Provides Lifetime Protection at Minimum Cost.

Various Forms Submitted.

No agents.

For further particulars concerning

RODGERS INSURANCE

(In other words, Rodgers Waste Heat Dryers)

Address

L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
Brick Works Engineers

Largest Manufacturers of Brick Drying Equipment in the United States

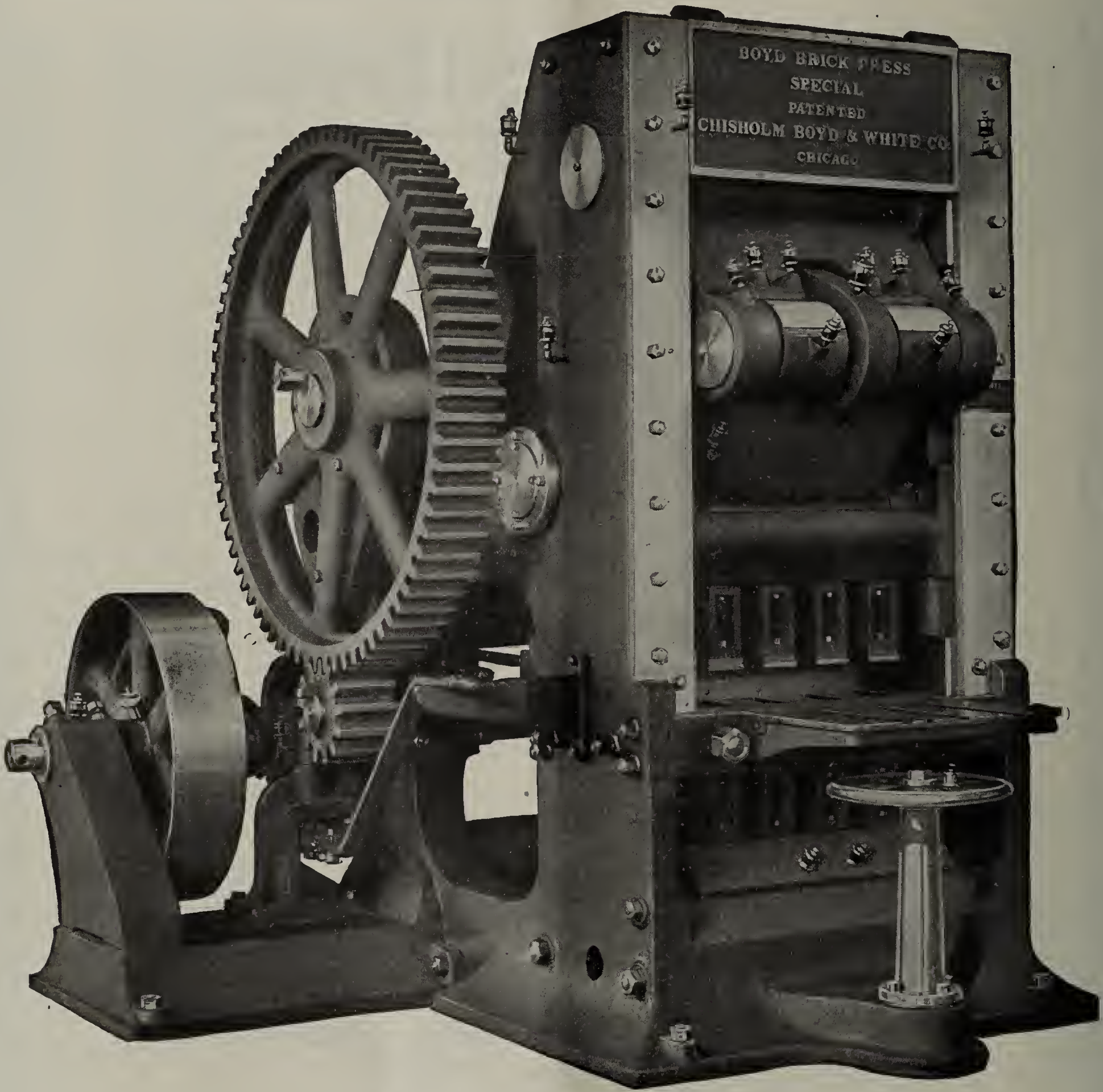
General Offices and Works

O
H ZANESVILLE, I
O

RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Buyers Ready Reference List.

To Find Any Particular Firm or Advertisement See "Index to Ads" as Cited on Front Cover Page.

Ammeters.
The Brown Instrument Co.
Beighlee Electric Co., The.

Analysists and Chemists.
Ceramic Supply & Con. Co.
N. J. State University.

Arch Cutting Apparatus.
Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.
Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.
(See Cutting Tables.)

Barrows and Trucks.
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Anderson Fdy. & Mach. Works.
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H. Brewer & Co.
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Chambers Bros. Co.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.
Roessler-Hasslacher Chem. Co.

Bearings, Roller.
(See Supplies.)

Belting.
Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.
American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Blowers.
American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.
American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.

Brick (Building).
Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).
Parker-Russell M. & M. Co.

Brick (Paving).
Alton Brick Co.
Aspha-Bric Corporation.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.
American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.
American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Mchy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Fernholtz Brick Machy. Co.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Soft Mud).
American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Martin Brick Mch. Mfg. Co., H.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).
American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Dry Press).
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
Fernholtz Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.
International Clay Mach. Co.

Brick Setting Machinery.
American Clay Machinery Co.

Buffing Machinery.
American Clay Machinery Co.

Burning and Drying Systems.
American Clay Machinery Co.
American Blower Co.
Boss, John C.
F. W. Dennis.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.
(See Dryer and Dumping Cars.)

Carbide Coating.
Stowell, E. R.

Castings.
American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.
Koch, J. J.
Lovejoy, Ellis.
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Freese & Co., E. M.
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(See Supplies.)

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(See Supplies.)

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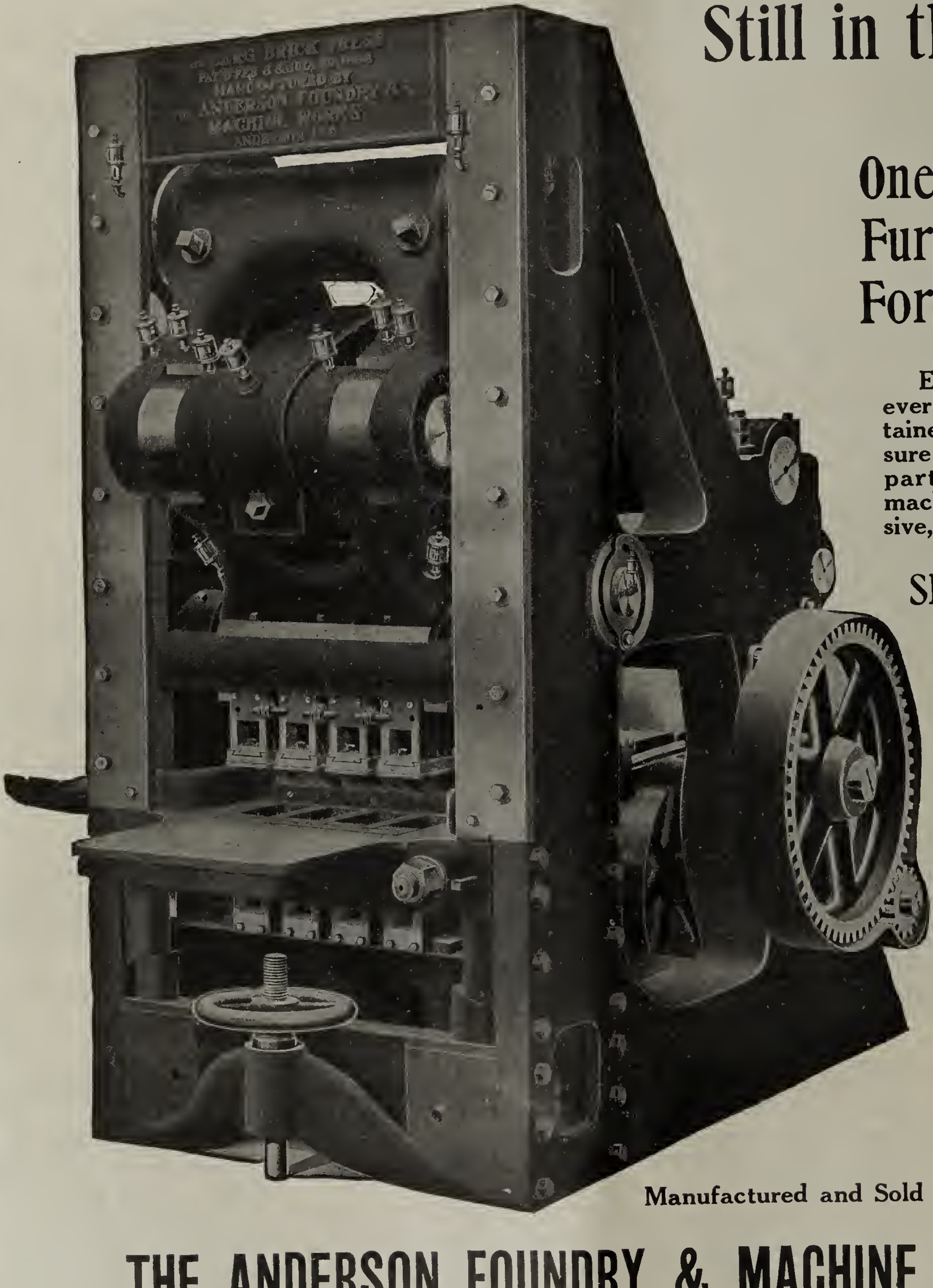

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Freese & Co., E. M.
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(Continued on page 659.)

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(See Brick.)

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Revolution Indicators.

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Ceramic Supply & Con. Co.

Revolving Steam Shovels.

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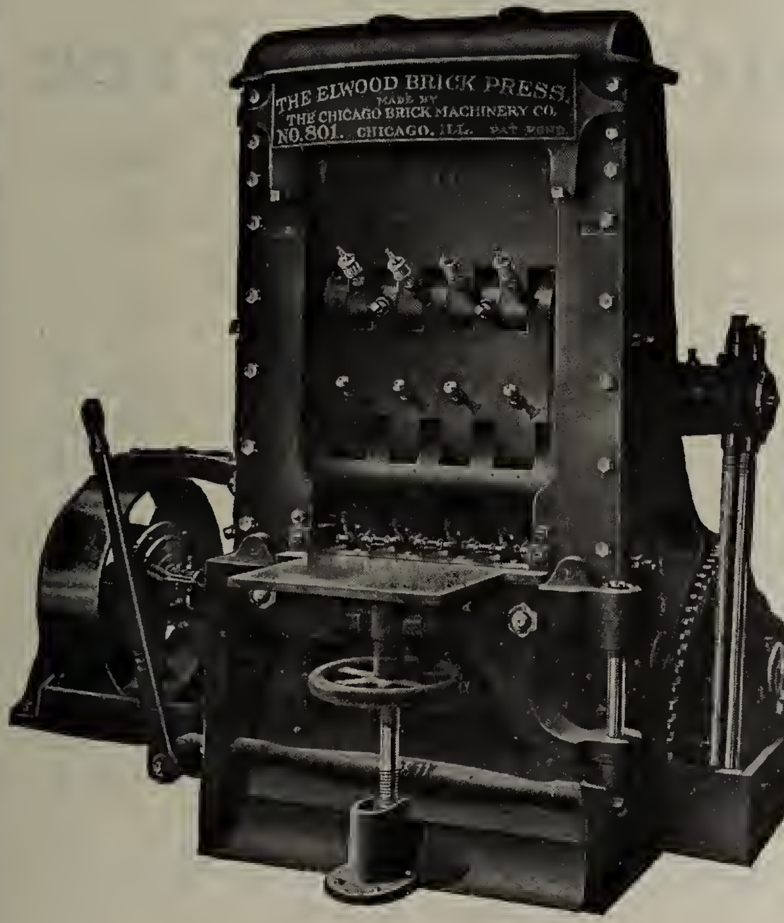
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Brewer Co., H.
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(See Barrows.)

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(See Pans.)

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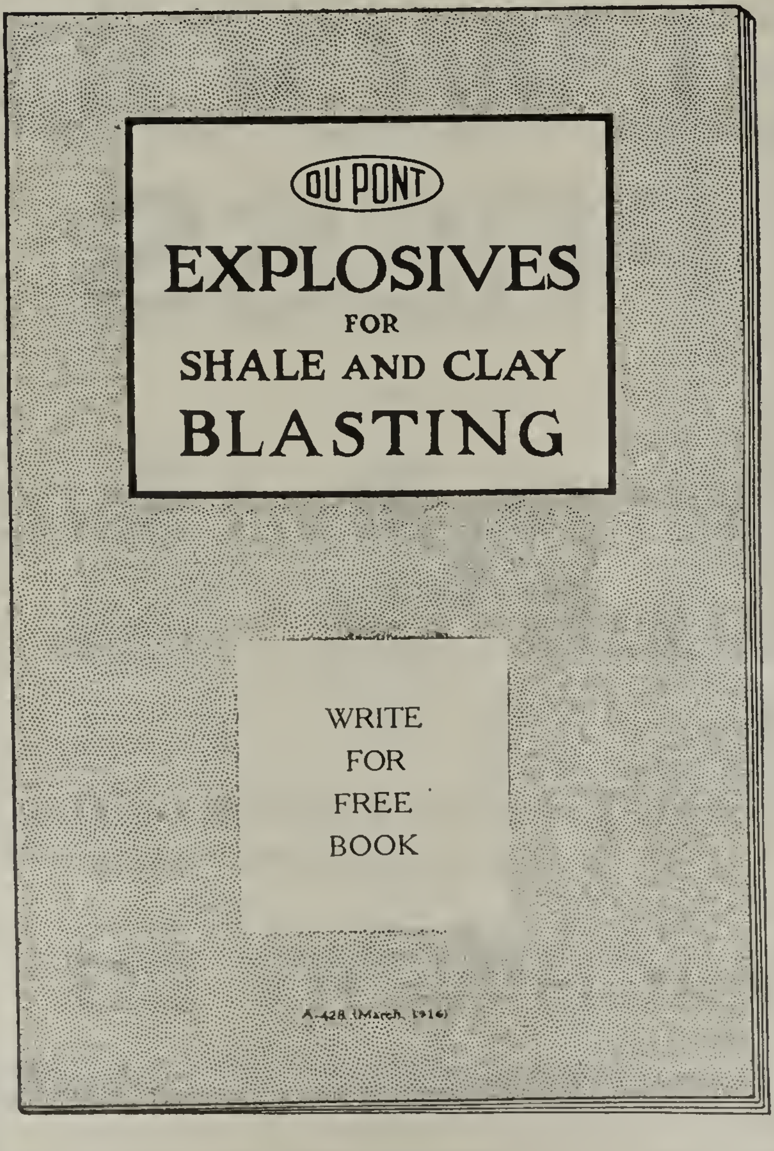
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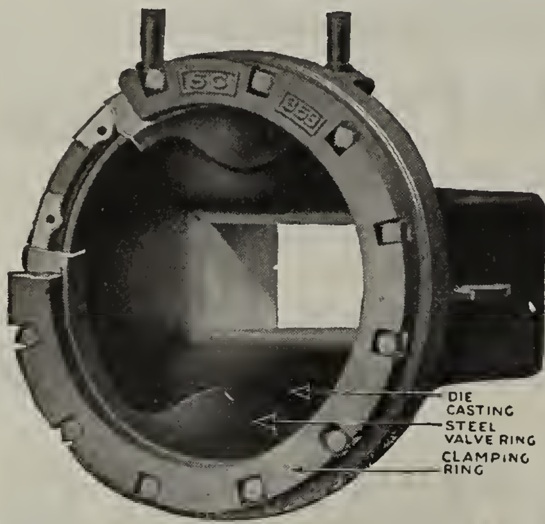

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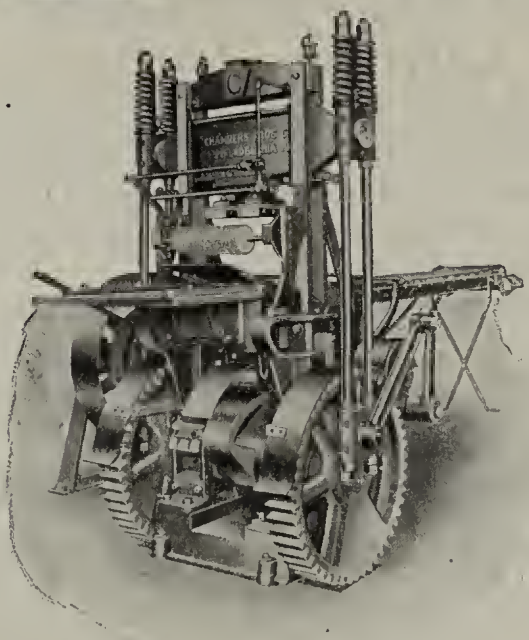

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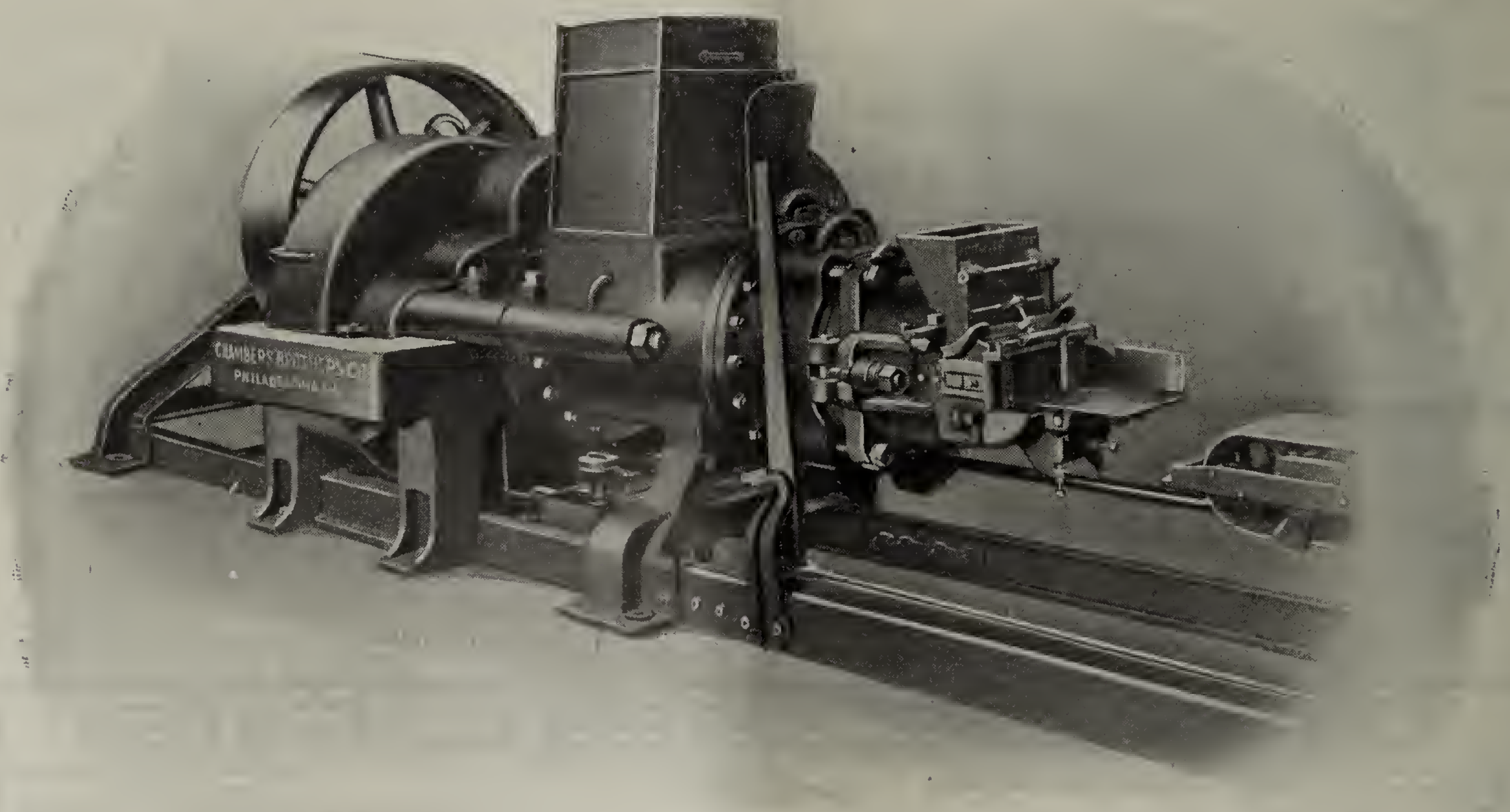

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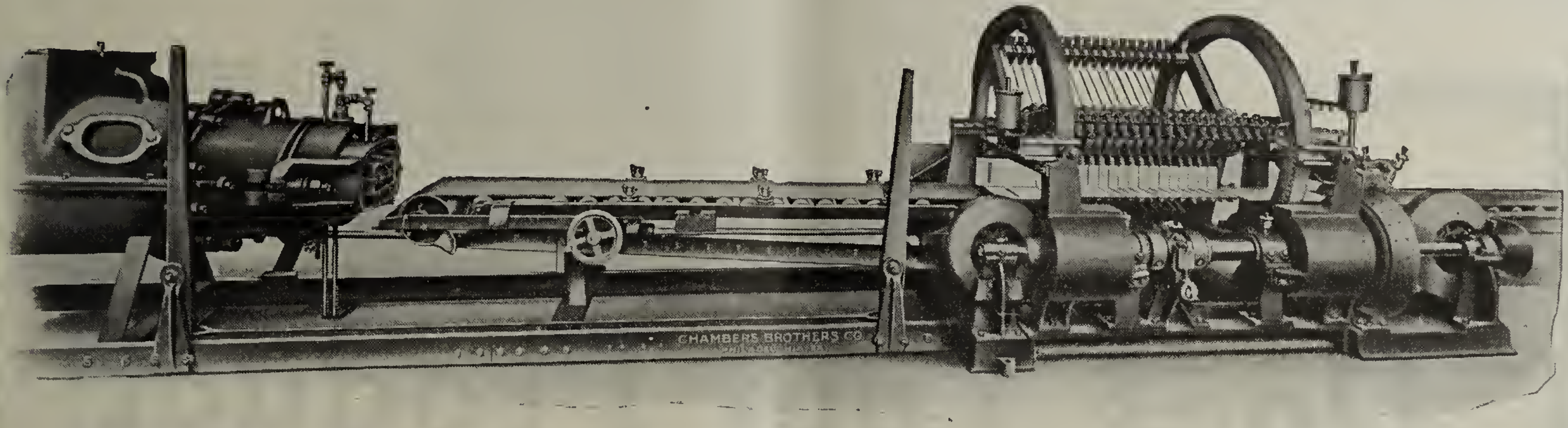

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W. G. Bush & Co	Nashville, Tenn.

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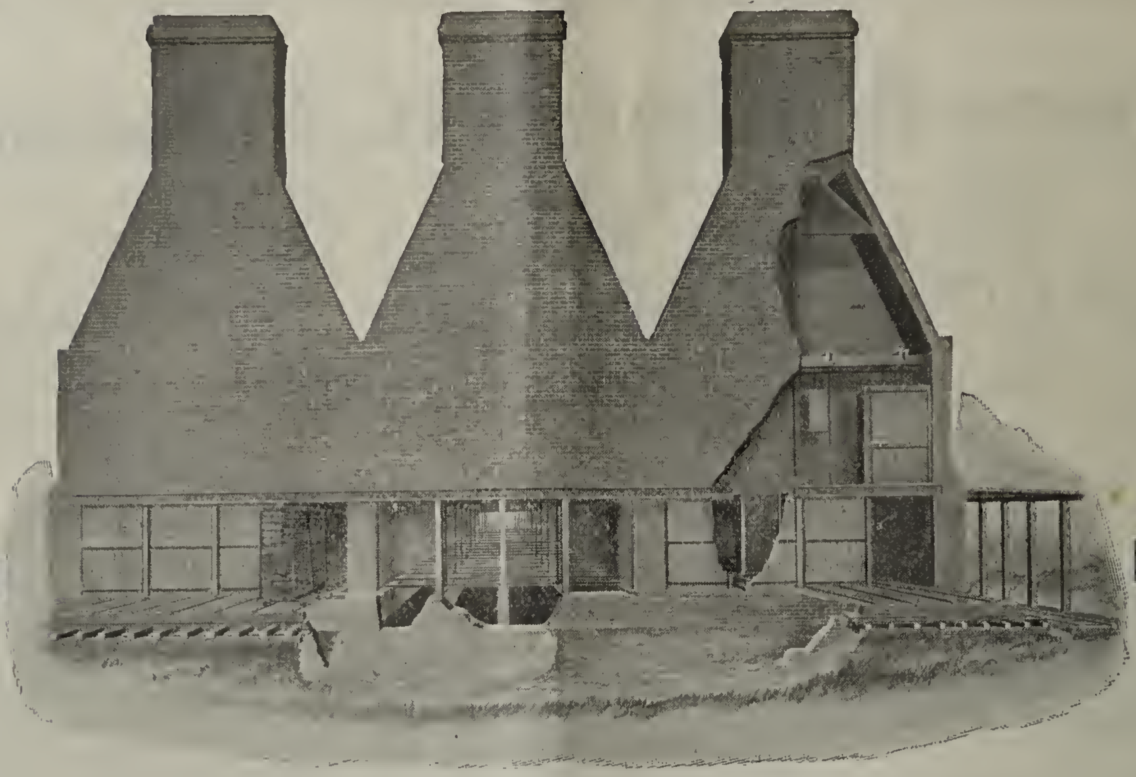
Chambers Multiple Brick Cutter No. 10



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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

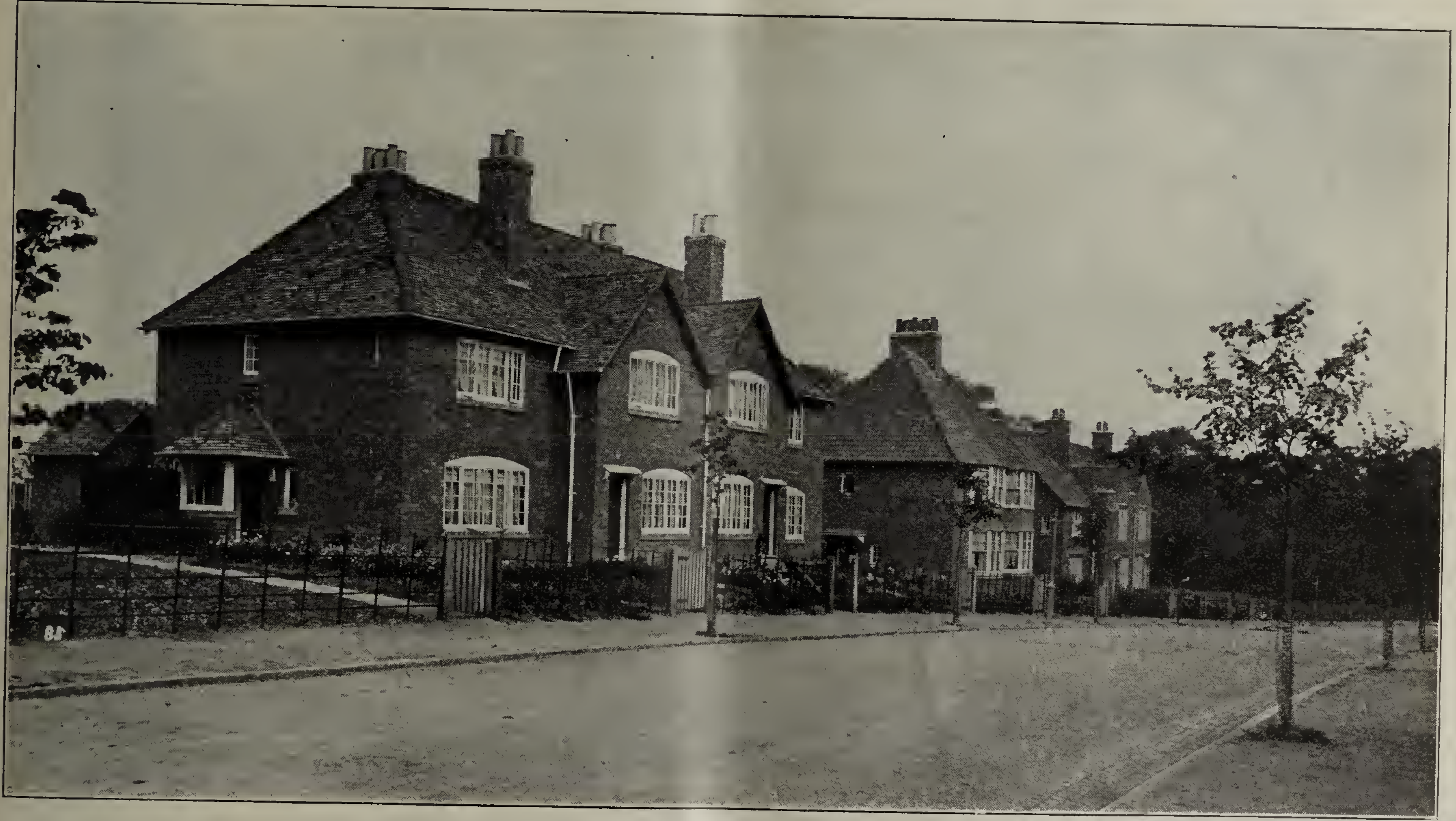
Vol. LXV. INDIANAPOLIS, IND., JUNE, 1916. No. 6

Written for The Clay-Worker.

A MODERN ENGLISH VILLAGE BUILT OF BRICK

A Splendid Example of the Adaptability of Brick Giving Pleasing and Lasting Results.

VILLAGES CAN be said to have developed on two lines, viz., self-development and systematic. The former can be said to be straggling, which often makes the picturesque; whilst the latter, often as not, bears the impressional stamp of mechanical construction. In many cases, in fact, in all new villages the same has been given birth, owing to some expansion of industry. Practically, the first attempt of housing by means of the creation of a village was at Saltaire, in the West Riding of Yorkshire, England, due to the efforts of the late Sir Titus Salt. Building a tremendous factory close to the River Aire, he formulated a scheme to house his workpeople, and although the efforts were far from equalling the garden villages of today, he nevertheless achieved something that some private employers are striving after today, namely, a contented mass of workpeople; and this cannot be brought about except by the two now recognized factors, viz., suitable conditions under which to labor, and secondly, though not less essential the claim to be properly housed. Of course, men recognize the effort of Sir Titus Salt, according to the time in which he lived, for he tried to make Saltaire as beautiful as possible and also as a village, self-contained, and the most remarkable point is the absence of gardens. (Sir Titus Salt is dead.) The absence of gardens is remarkable.



Brick Cottages in the Brick Built Village of Bournville, England.

Saltaire today, however, cannot be compared to other English garden villages recently built, Bournville, Port Sunlight or York Garden village. Whilst Saltaire can be said to be purely housing, the other villages mentioned, seem to have been designed with a view of housing with beauty, a getting back to the olden, a copying of the type of the delightful villages of Devon and Somerset, the glorious outgrowth of a period earlier than the Elizabethan.

The Garden village of Bournville is in North East Worcestershire, some four miles out of Birmingham, and was commenced as far back as 1879, or some two years later than the birth of Saltaire, but the bulk of the village dates from 1895.

Founded by Sir George Cadbury, the village now is managed by the Bournville Village Trust.

In formulating the design for the village, in the scheme of development it was decided, first, that each house must have a good-sized garden, no building must occupy more than one-fourth part of the site on which it was to be erected.

The first was to sell the sites and cottages outright and so create a class of small freeholders. It was, however, soon found out that this would open out some grave objections and, in fact, antagonistic to the ideas of garden suburb development, the chief, of course, being the difficulty of insuring that the property thus sold would be administered by the new owners in harmony with the motives and wishes which inspired the vendor. This plan was not, therefore, persevered with. At the present time land is now let for building purposes on 99 years lease.

There are always misunderstandings in regard to private firms building villages, and one very important one is the idea that these colonies are reserved to be inhabited by a chosen people. In many of the Krupps villages in Northwest Germany, people inhabit the houses who do not work for the Krupps, whilst at Bournville less than one-half the householders work for the firm of Cadbury's, though it must be understood that it is more difficult to get a house under Krupps than Cadburys. The distribution of employment is shown by the following, compiled from a private census made some years ago:

Proportion of householders working in Bournville, 41.2; Kings Norton, 4.7; Selly Oak, 13.9; City of Birmingham, 40.2.

The cottages are, as a general rule, semi-detached or in blocks of three or four, and there are about seven houses to the gross acre. The majority of the houses have two sitting rooms, a kitchen or scullery, three bedrooms, and the usual conveniences, and quite a novelty has been added lately, two quadrangles of small bungalows suitable for single women.

The village is supplied with its gas, water, etc., from Birmingham, and the table of rents works out as follows. The cheapest houses are let at 4s. per week and rates.

31 houses at 4s. 6d. per week or under and rates.
106 houses over 4s. 6d. and up to 5s. 3d. per week and rates.
144 houses over 5s. 3d. and up to 6s. per week and rates.
99 houses over 6s. and up to 7s. per week and rates.
86 houses over 7s. and up to 8s. per week and rates.
170 houses over 8s., including shops.
160 sold and occupied by owners.

At the present time there are 846 houses in the village. Outside the Trust property are 38 houses belonging to the Alms House Trust, and 22 houses belonging to Messrs. Cadbury Bros., which are always included under the name Bournville. Taking all together, there are 906 houses, with a population of 4,300.

Krupps, in Northwest Germany, in their colonies, have used brick as the chief medium for building their houses, but in most of the buildings they have used rough cast as a finishing material on the external face. In England, Port Sunlight, York and Bournville, are chiefly brick built with no covering to hide the brickwork, which seems to blend so beautifully to the surroundings, which could not have been done in any other building material, and also from an economic standpoint. Of all recent garden village development the "Bournville" is charming to a degree, and as the years go along, grey age seems to enrich the brick of the houses. The village meeting house is a delightful example. The result being very effective and it also combines in a natural fashion to any stone used.

Two of the accompanying illustrations show two different types of houses built of brick, and in one case the roof covered with red rich tiles. In some cases, the ivy and its relatives, the "creeper family," find the red rich bricks a good base on which to thrive, and the result again is delightful. In garden village construction there can be no more suitable material and it is quite evident the English garden vil-

Typical Vineclad Brick Homes near Bournville, England.

lage builders have learned the lesson "to build with brick."

Bournville is based on right lines, surrounded as it is, by exquisite beautiful surroundings and open country. Unlike Krupps colonies, at Essen, it does not suffer from a rigid hard L fast mechanical expressional, so characteristic of the Prussian idea behind the development of the Krupp colonies.

It is a model brick-built village, on which not only English houses, but other countries can design and formulate their villages. It is neither Slavish or Fettish; the rich red brick gives it a warmth which endears the village to the people who inhabit it.

Time and years will only add to its additional beauty, and not only does it house the people, but it possesses the greatest factor of all, housing with contentment and attached beauty.

J. W. O.

SAFEGUARDING THE EMPLOYER.

A full share of attention has been given during the past few years to the subject of safeguarding employes. Now there is another angle to this safeguarding business that needs some attention and that is the idea of safeguarding the employer himself.

A Village "Meeting House," a Fine Example of Simple, but Attractive Architecture.

Specifically the idea in mind right now is that of safeguarding the employer against such emergencies as the sudden departure or disability of an employe on whom there depends quite a lot of the immediate success of the work in hand. There is a full share of these employers in the brick industry all the way from superintendent down. It is an industry in which there are peculiar orders of skill required, not only in the handling of machines and material, but in the burning process there is an order of skill and training required that calls for special safeguarding.

The safeguarding in mind is that against loss and damage through temporary or permanent absence of some employe without due notice. About the most practical safeguard that suggests itself in this connection, is that of training understudies to every man connected with the business which holds a position that would cause a hitch in operations were he unexpectedly absent. There are many places in the clayworking industry where so much depends upon some one man, that if he is absent there must really be a stop or some long chances of things being done wrong and loss resulting. With a man trained as an understudy to take the place of each man of this kind, at a moment's notice, it would constitute a practical and reasonable safeguard of the employer and the business.

There is a whole lot more trouble about installing safeguards of this kind, however, than there is about putting safeguards around machines to protect men while they are at work. The average employee filling a place of responsibility that calls for skill and brings good wages or salary, does not relish the idea of having some one else trained to take his place. It looks too much like putting himself in a position where he will either have to be good or lose his job, and it is perfectly natural that the employee himself should not only fight shy of encouraging this idea but should actually resent having it put to work.

The problem is to smooth out the wrinkles and eliminate the objections here. There is no question but what we have reached an age of industry where the business and the employer need safeguarding as well as the employee. For business to run without hitches there must be some person or means for replacing absentees, no matter what the cause of the absence. Of this there is no question, the question is, how to get it.

One idea that suggests itself as having good practical possibilities is that of reducing work to specific data and formula wherever possible. Careful records of not only temperature in burning but all other details connected with it, may prove a good help in case of such an emergency as the absence of the man having charge of the burning. In a different way the same idea applies to the mixing and treating of the raw material, to the machine work and to every step in the process of manufacturing clay products. The idea is to seek to reduce to black and white data for records, as nearly as possible, all the details of the business so that even one who has not been trained in the particular work can take these records and take up the work and carry it on with the fewest possible errors.

INDIRECT SALES PROMOTION.

In Which a Suggestion is Made for the Voluntary Registration of Drainage Systems at the County Seat for the Protection of the Future Purchaser, and to Enable Proper Land Values to be Estimated.

BY J. W. ANDERSON.

"SALES PROMOTION" is the general term applied by modern business to those activities which relate to the creation or cultivation of a market for a product or a service. It is in the highest sense constructive work, and, in its broader phases, involves careful consideration and treatment of conditions affecting manufacturing and sales operations.

Its possibilities in a given line are measured principally by the soundness of the general policies of the manufacturer or industry represented, serviceability of product and its adaptability to demands existing or possible of creation, and the character and extent of natural or competitive resistance encountered.

Frequently an improvement in product or service will in itself multiply opportunities for expansion. By the same token a fundamental, and sometimes an apparently minor, defect in product will greatly restrict development, even in the face of most strenuous and otherwise intelligent effort.

It is not meant that the product must be brought to a state where further improvement is impossible, but it is necessary that it represent a reasonable and acceptable answer to the demands of the trade and to service requirements. When, by chance or design, it offers the best answer, possibilities are increased and resistance is more easily overcome.

Back of the sales promotion campaign must be facilities for manufacture and distribution, operating under intelligent management, able and determined to break the shell of convention, and ignore tradition when policy demands. Unless general management blends into well-balanced relationship, factors of production and distribution co-operating along lines of definite and sound policy, broad and permanent expansion will be impossible of achievement and the richer fruits of the most carefully planned promotional campaign will be denied.

Often, before an industry still free from monopolistic control, a fertile field for sales promotion remains under sod because of lack of initiative and vision on the part of manufacturers in the line, or because of the reluctance of a majority of them to organize for a work that cannot be accomplished successfully by one or a few.

This condition is a brake on the wheels of progress. Such brakes will not hold permanently. If the sluggish industry does not speed up of its own initiative, its momentum is reduced or checked by outside competition, or some adequate combination of brains and capital gently removes the brake, takes control as its fee and diverts profits to its own uses and to other conquests.

The history of industry in America is so full of examples of these changes that specific cases need not be cited. What has not been so apparent, however, are the causes of such changes. If the graves of the defeated companies could be opened and a searching autopsy held, it probably would be found that most of them died from some curable form of the disease called neglected opportunity.

Turning from unpleasant post-mortems, we find what living examples of intensive cultivation of opportunity? Here, again, cases are numerous, not only among industries monopolized in part, but among independent manufacturers who are showing marked progress.

When the Standard Oil Company spends money freely to perfect and thereafter to introduce generally an oil stove for use in your home, it is promoting the sale of oil, and the direct profits earned in marketing the stove are secondary. Your electric station is following the same lines in its efforts to persuade you that you should have at home an electric iron, toaster, range, sewing machine, washing machine and all of the various devices that have been perfected for the purpose of creating a wider market for "juice."

The electrical people have not been slow to take advantage of the popular idea that "Electricity" is synonymous with "Economy" and "Efficiency." They have capitalized the wonder of the public at the mysterious performances of their product and have cultivated their markets intensively.

When the manufacturers of automobiles recently threatened to combine and go into the business of producing oil to bring down the price of gasoline, they were recognizing the relationship existing between the cost of power for driving their cars and the volume of their sales, and were considering, no doubt seriously, the investment of vast sums to promote the sale of automobiles and trucks by reducing the cost of running them.

J. W. Anderson, Mishawaka.

Recently the Hercules Powder Company covered the country with advertisements in leading magazines, in which they advocated game farming, and particularly the raising of pheasants. They are but one of a number of firms that might profit by the sale of powder for shooting this game, yet they judged the investment in this advertising to be worth while. It was remarkably clever of them to suggest pheasants. Those of you who have tried to hit a flying pheasant can testify that it is an ideal selection from the standpoint of affording the maximum practice or number of shots per bird, and for creating an urgent demand for more powder.

In this advertising the Hercules company should be joined by all other makers of sporting powder and the campaign should be carried on by the association. There appeared in a number of recent magazines advertisements of such an association of manufacturers of hot-air furnaces for heating and ventilating buildings. Here the accent is placed on ventilation and on other claims of advantages of the hot-air system, as a class, over all steam or hot-water systems. There is displayed an association trade mark, and you are told that all manufacturers whose product has reached that high standard of perfection necessary to secure for them the right to membership in the association are using the trade mark on their furnaces.

Thus does each contributor to the association receive his proper share of the benefits of association advertising. He uses the association trade mark, in connection with his own, in his individual advertising, and makes capital of the fact that he has been admitted to membership.

This has been conceded to be in most cases the best method of insuring equitable distribution of benefits in connection with sales promotion through advertising by such an association. It is more satisfactory, as a rule, than publishing the membership, because the big manufacturer, who is assessed usually in proportion to his output, complains that publishing a list of members in association advertising gives the small concern equal prominence for a much smaller consideration. An association of manufacturers of clay products in Iowa tried publishing its membership in its advertisements, and thereby lost the support of some large manufacturers who had started as members. A simple, registered association trade mark would have been more satisfactory, and probably will be found a necessity.

All sound business development must be based on or center around the idea of service. Your product or your performance must meet some need or satisfy some desire of the customer.

A necktie contributes principally to appearance. The purpose of the wearer may be only to conform to custom or he may wish to dress in extreme style. Perhaps he prefers a certain color and is unwilling to pay more or less than a certain price. Therefore we have ties of various shades and fabrics.

The appeal to the eye is recognized as a sales factor also in marketing products sought primarily for their utility. A highly polished surface adds nothing to the serviceability of a carpenter's hammer, yet the majority of carpenters are willing to pay well for the polish. Even in so practical a thing as a tile machine the manufacturer strives for and the customer appreciates pleasing lines. The maker of face brick, while looking well to the practical qualities of his product, gets his price and his volume only if his brick meet the desire of the builder or architect for certain artistic effects. The principal value of the classics lies in their text, yet thousands of expensively bound volumes are sold each year.

In some cases a purchaser is able to predetermine accurately the adaptability of an article to his purposes, while at other times he must rely almost wholly on his confidence in the manufacturer.

To a very large degree inspection will disclose the quality of a drain tile or an axe handle, but when you buy a set of tires for your automobile you get in return for your dollar simply a promise of one hundred cents' worth of service. You are really selecting a manufacturer more than a tire, and you are actuated by your belief that his promise will be redeemed at par. The only sound basis for such belief is reputation and past performance. Thus simple honesty proves a firm and permanent foundation on which to build for increased sales.

Service, as a factor in sales promotion, may be extended to the customer in numerous forms, varying in relative importance with conditions in different lines. Customers will wait several weeks or months for the delivery of their favorite automobile, but a delay of a few hours in the delivery of an antitoxin might result in a cancellation of the order. A manufacturer of shells may wait months for the delivery of lathes, while the strongest feature of the ice cream soda business is the ability to approximate delivery closely, in point of time, with the customer's consciousness of thirst.

Usually the moment of delivery of the product to the customer may be considered as the point ahead upon which one branch of service centers and also as the point from which another branch or kind of service begins.

It is in the period before delivery that careful provision must be made by the manufacturer for the service to be rendered after delivery. The service received from an article in use is through the yielding up of built-in values, the final expression of the engineering and manufacturing skill of the maker.

As an example of a business in which various lines of service have been developed highly we have that of a prominent company manufacturing equipment for the mechanical transmission of power and the continuous handling of materials.

They originated and perfected the split pulley with the interchangeable bushing, and thus made one size pulley adaptable to many shaft sizes and applicable without taking down shafting already in place. They originated and perfected the American system of rope driving and adapted this most efficient form of large drive to almost every conceivable operating condition. These ideas were powerful factors in promoting the growth of their business.

For over thirty years they have specialized as transmission manufacturers. Some years ago they conceived the plan of establishing, in the principal cities, warehouses carrying a complete stock of their standard products, as a means of increasing the value of their service to their customers. These warehouse stocks were supplemented by other stocks carried by hundreds of dealers throughout the country. The success of this policy eventually brought such an increase in business that they were compelled to enlarge their factories greatly. An enormous warehouse was built at their factories for carrying large stocks as a reserve against the increasing demand which came as an expression by the trade of appreciation of the improved service. Thus by adopting and following a sound service policy, what actually was a wide departure from anything previously or since undertaken in the transmission business, proved an effective means for promoting sales.

A sales and engineering subsidiary was formed by the above company in 1914 for the purpose of improving their service to the customer along the above and still other lines. This company has available thirty years' accumulation of data and information on conditions in the various industries affecting the installation and successful operation of power transmission equipment. They have in their organization a staff composed of men who have made, in connection with their general experience in transmission engineering, a special study of the requirements of some one industry. To this staff have been added recognized authorities on various industries, and thus to each industry a specialist is assigned.

This specialist devotes himself exclusively to the service of manufacturers in his industry. Exhaustive research is undertaken, and through this engineer and his assistants one manufacturer may profit by the experience of others in his line. This staff operates under the direction of a chief, who so coordinates their work that any idea resulting in improvement in one industry is immediately available for application in all other industries.

As an example of this service a staff man visited a clay plant, where he found the superintendent fighting to maintain output with a clay conveyor which had failed and was failing daily to perform its duty. This conveyor was up against a severe and somewhat unusual condition and had been rebuilt three times in an effort to make it work. The staff man took a number of measurements and prepared a drawing which looked good to the superintendent and which resulted in a correction of the trouble. This company has since applied the same idea in other industries and in other clay plants.

As another instance, a staff man was familiar with a series of tests made by prominent engineers to determine the value of exhaust steam as a heating agent. The reports were placed promptly in the hands of the entire service staff. Another staff man, shortly thereafter, was consulted by a manufacturer of clay products with reference to the transmission for a new plant. On looking over the preliminary plans it

(Continued on page 726.)

"WOOD WON'T BURN?"

A Half Humorous Criticism of the Lumber Advocates' Methods of Publicity and a Few Serious Thoughts Concerning Well Burned Clay Products.

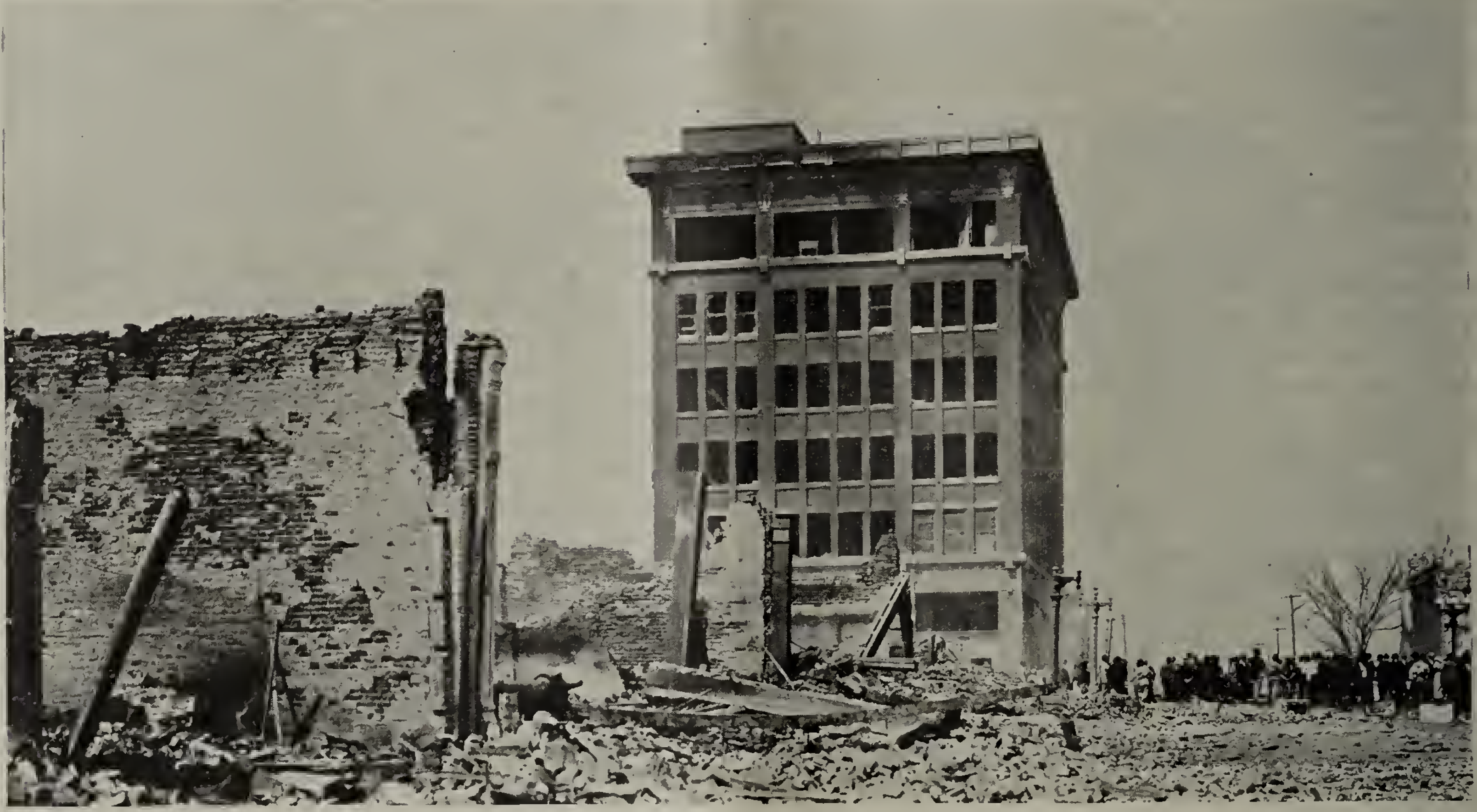
"WOOD WON'T BURN?" Isn't that a ridiculous statement? A six year old boy knows better than that; yet the lumber people are trying to convince the public that their material is fireproof. We do not believe the public is so gullible, still the lumber interests seem to think so, else why this extensive use of laughable articles in the newspapers of the country trying to convince us that wood is fireproof?

Think of the first reader starting off something like this: "No, my boy, wood won't burn. Wood is fireproof. Why is wood fireproof? Because it won't burn. Yes you can play with matches. Why, because wood won't burn." That is ridiculous isn't it? Yet that is just about the tenor of a great many articles now appearing in the daily papers of the country, the sole purpose being evidently to fool an unsuspecting public.

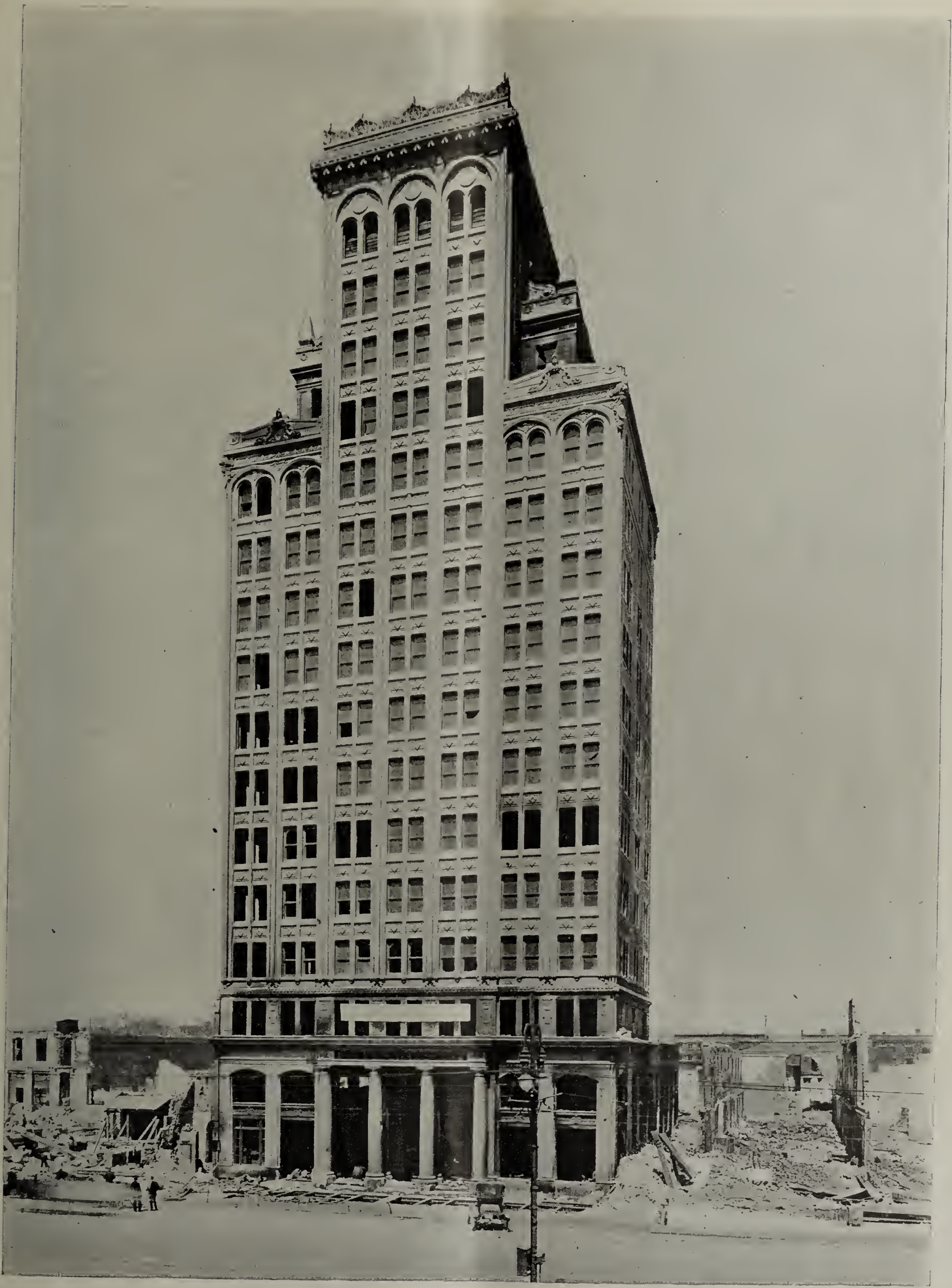
My gracious what would primitive man have done if wood was fireproof? He no doubt would have been a vegetarian and we would never have known the deliciousness of creamed sweet breads, turkey, quail or strawberry short cake. We would be living on uncooked fruits and nuts and wild onions—that is—if wood wouldn't burn—or—perhaps he might have accumulated dried leaves, but my what a store he would have to lay in for winter. The aesthetic senses certainly would be satisfied with the color of the leaves and the leaping flames but think of the stomach trying to digest wild boar's feet cooked in the heat of a bon fire or rather think of trying to cook a brontosaurus in the same fashion. Their barbeques would certainly have taken months of preparation.

Wood won't burn—well, maybe the lumber interests are speaking in a chemical way. Wood you know is composed of hydrogen and carbon combined in form of fibers. These fibers are made up of many cells. These cells are made up of molecules of C H (carbon hydrogen). Hydrogen is one of the most highly combustible elements in nature. Two atoms of hydrogen combined with one of oxygen drawn from the air produce a molecule of H_2O producing great heat. Carbon is the most highly combustible solid element. We say solid element because it usually occurs as a solid. Hard coal is nearly pure carbon, soft coal has much hydrogen carbon compounds still in it and burns more readily and easily because of the volatile hydrocarbon gases easily driven off by heat. One atom of carbon combines with two atoms of oxygen and forms the molecule CO_2 or carbon dioxide. Great heat is produced. We will admit that speaking in a strictly technical sense wood won't burn. We can prove it technically by showing that wood breaks up into volatile gases under slight heat and that it is these gases that burn. These gases produce enough heat to keep right on breaking up the wood fibers into volatile gases and the combustion is thus self supporting. The initial amout of heat necessary to start the combination is small, a single match will light the corner of a dry 12x12 beam in an old well dried building.

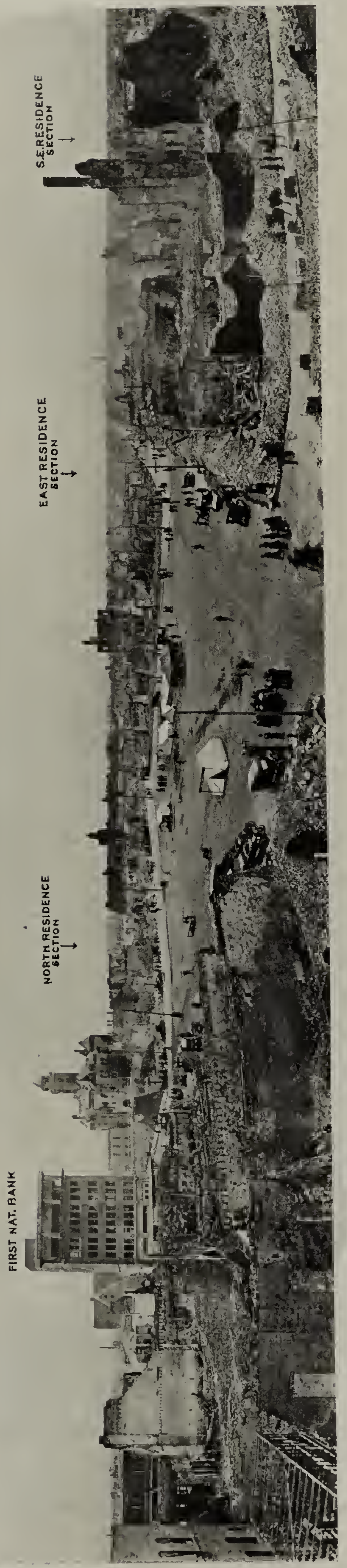
The usual building lumber has also large amounts of resinous gums, tars, turpentine, etc., combined among the fibers and cells of the wood. Perhaps the lumber people would have us believe that turpentine won't burn, that pine tar is a proper material to blanket a fire with and resinous pine knots never were used for torches. It is the first principle of chemical science that nothing is destroyed, all elements continue and are indestructable. Perhaps this is the theory of the lumber advocates. The next step in the knowledge of chemistry is that reactions do occur. Fire is a common term used in naming one of these reactions. Perhaps the lumber advocates



One of the Few Structures Remaining After the Fire at Paris, Texas. The Brick and Terra Cotta in this Building was not Injured by the Fire. The Use of Dynamite in the Immediate Vicinity Injured Some of the Heavy Projections. Protected by the Atlantic Terra Cotta and the Face Brick, the Frame of the Building was Uninjured.



Empire Building, Augusta, Ga., after the Fire. The Interior of the Building was Burned out, but the Brick and Terra Cotta Work was Uninjured. The Limestone Faces of the First and Mezzanine Stories and the Granite Columns are Spalled, Cracked and Calcined. The Facade of Atlantic Terra Cotta is Fundamentally Intact.



A Glimpse of Paris, Texas, after the Recent Disastrous Fire, which Destroyed Seventy Per Cent of the City. The Building that Stood the Fire Best was the First National Bank Building, the exterior of which was Faced with Atlantic Terra Cotta and Brick.

—Courtesy of Atlantic Terra Cotta Company.

are looking for fire reaction to turn the elements back into the form of lumber. So technically speaking we may agree with them that wood doesn't burn, but gee whiz, the fibers certainly are kept busy during a fire.

Since wood doesn't burn it is time for us to order a load of brick to use in starting the kitchen fire and time to specify chimney built of wooden lumber for all houses built in the future.

But laying all jokes aside, why argue with people making these contentions, they are fooling no body except themselves.

How absolutely ridiculous it is to compare wood with well burned clay products; for the latter have gone through the fire test in the making and stand a higher heat than that of any ordinary fire. Of course, there are some temperatures no building materials can withstand but well burned clay products stand a more severe test than any other material.

Why should the lumber people try to argue this fact down when lumber is used so extensively in interior work and always will be in demand? It is simply a hoggish desire to have their material used every where whether adaptable or not.

There are certain places where cement is more desirable than clay products, we do not deny that statement and we consider the world fortunate in having cement as a building material. It is a Godsend to us in the building of our bridges and construction work of various types, it has its field and it is indeed a large one. We are for cement used properly as we are for lumber used properly. Both have large fields and are of great importance to the building world.

We do contend, however, that neither lumber nor cement can compare with well burned clay products in beauty, strength and durability. Concrete is good if it is made properly, with the right kind of materials and in certain definate proportions but it can not be made cheaply. We contend rightfully that if concrete is good it isn't cheap and if it is cheap it isn't good. There is no room for argument on that score. Lumber is a splendid material for interior work and has a wide range of serviceability but it is not fireproof by any means.

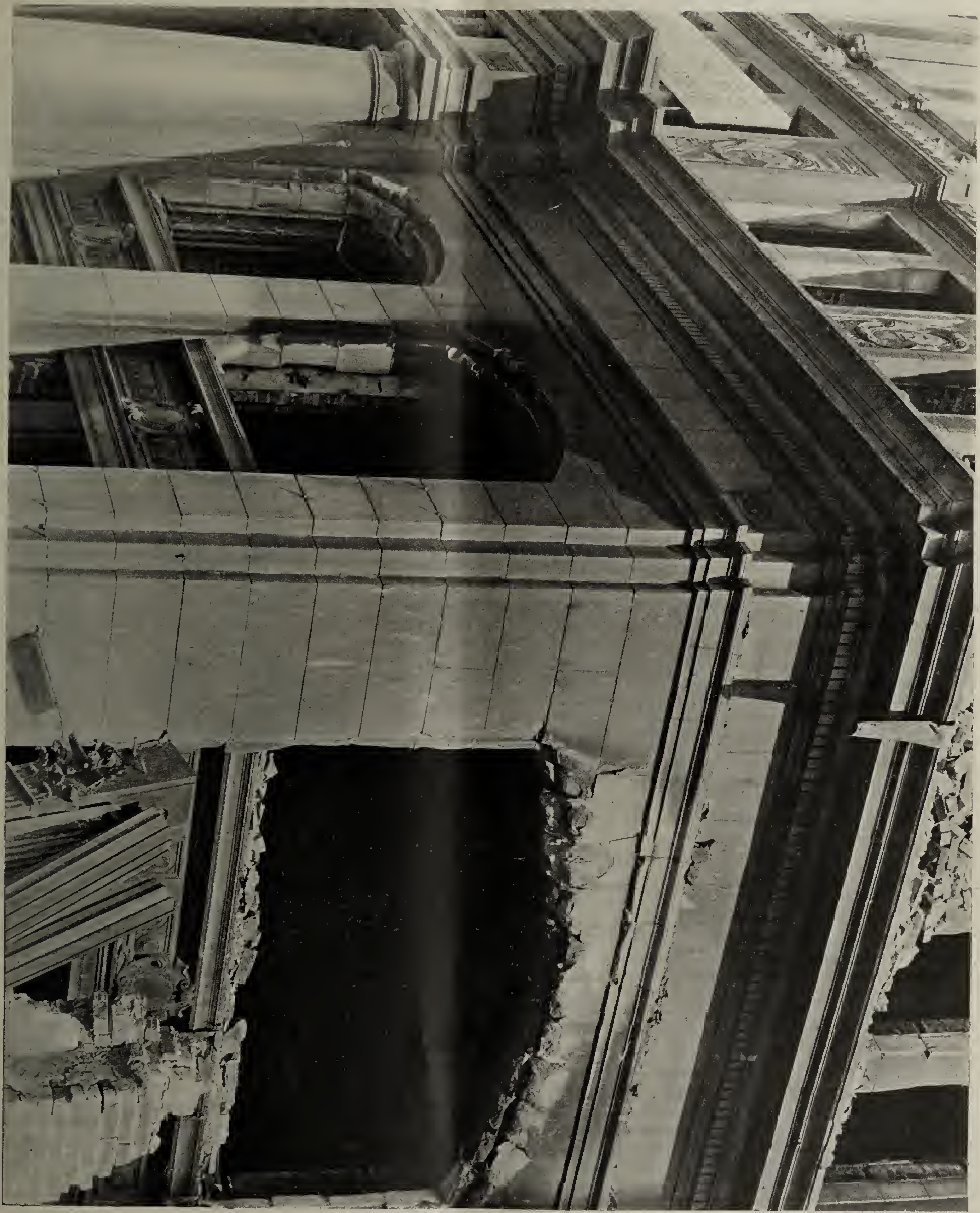
Cement, lumber and well burned clay products should work hand in hand. It is when any of the materials are placed in the wrong fields that disaster results.

Well burned clay products as building material have their field and rightly claim their place as the best fireproof building materials manufactured. There is no building material as safe and at the same time giving any and every shade of color, or combinations of colors, desired, as well burned clay products.

The Salem fire was stopped by a brick wall, proof positive of the sterling qualities of well burned clay products. That terrible disaster was caused by inflammable wooden shingles. The fire originated in a leather factory, a frame structure, an easy prey for the flames. In fifteen minutes this and an adjoining building was burned to the ground and a great fire started a strong wind carrying the flames and sparks to the wooden shingled roofs of the nearby buildings. In twenty-four hours over half of the historical old town of Salem was wiped out. Do you think frame structures are safe?,

The same thing happened in nearly all our great fires, the one at Chicago, the one at San Francisco, Baltimore and Chelsea, etc. All resulting from the lack of proper safe guard in construction of residences and buildings. Frame structures are dangerous at all times and a city built of the same is like a city of cards when once the elements attack it. Not so with brick or other well burned clay products, they have been through the fire in the making and give the desired protection. The floods can not wash them away. They are weather proof, fireproof and time proof—when will the world at large realize the importance of building with brick.

The brick buildings for the most part stood the test and



Cornice Over Mezzanine Story of Empire Building of Augusta, Ga., which was Subjected to the Same Intense Heat that Destroyed the Limestone Jambs and Lintels, yet the Cornice of Atlantic Terra Cotta was Unimpaired.

Salem was rebuilt with brick. It was a very expensive lesson, however, in loss of lives and property. Where fire attacks a brick building the brick are never damaged, it is faulty construction that causes brick walls to topple. Even so they are not destroyed. The brick can be used over again, not so with frame buildings that are destroyed by fire.

Concrete has had its lessons in many disasters. Concrete buildings have collapsed and killed many families due entirely to faulty construction. The Indianapolis disaster proved this —the Edison fire was a glaring example of the non-fire resisting qualities of concrete.

The disasters of recent date in the south, in Texas, Tennessee and Georgia again prove the absolute crime of building frame structures and not making them fireproof with well burned clay products.

In these recent conflagrations again the wooden shingle played havoc and added fuel to the flame. The papers of the country would not have contained the bold head lines telling of the great losses by fire in those recent conflagrations had the buildings been built of brick.

Those three disasters are still fresh in the memory of all wide awake Americans so we need not detail the causes and effects. We simply wish to reiterate that frame construction was the cause and that it is a crying shame that city ordinances will permit the erection of anything but brick or other fireproof structures in sections where so many lives and such valuable property is at stake.

We are pleased to show herewith some monumental examples of the ability of well burned clay products to withstand the severest tests of fire. One of the illustrations shows the Empire Life Insurance Company Building, Augusta, Ga. The limestone face of the first and mezzanine stories and the granite columns are spalled, chipped and calcined, but the facade of terra cotta made by the Atlantic Terra Cotta Company is fundamentally intact, even the smoke stains can be removed. This seemingly remarkable example is really not in the least remarkable, for in the process of manufacture the Atlantic Terra Cotta undergoes a kiln temperature of 2250 degrees Fahrenheit, a far greater heat than it would be called upon to bear in any fire. More convincing perhaps is a glimpse of the terra cotta while hot shimmering and translucent in a kiln under fire.

In a local fire where it is possible to reach red hot terra cotta with a stream of cold water, the terra cotta may crack and in a general conflagration it may be injured by explosions or the failure of less dependable materials, but ordinarily the devouring elements cannot digest terra cotta.

In a fire that spreads from one building to another, as the case was in Augusta, the lower part of a building is subjected to less intense heat than the upper part. Nevertheless, the heat is sufficient to effect irreparable damage to the usual building stones. In the view of the main entrance of the Empire Building shown herewith, you will note that the base and part of the shaft of the granite column are ruined; the limestone door jamb is permanently disfigured. Even a load of falling brick failed to injure the terra cotta cornice, but the limestone cornice is severely damaged. All of the damage is not apparent to the eye, for under extreme heat stone is apt to become calcined and will crumble almost at the touch.

Another view is of the disaster in Paris, Texas, where the First National Bank, a reinforced concrete frame building veneered with terra cotta and face brick gives another example. Dynamite was used very close to the bank and accounts for the breakage of some projections, but structurally the frame is intact.

But fire safety, while important, is only one of the dependable qualities of terra cotta. In construction it is economical, both primarily and in the long run. It is the most adaptable and versatile and the most enduring of building materials. The cost of upkeep is negligible; it consists of an occasional cleaning down—less frequently than with other materials and not with sandblast but with plain soap and water.

THE CERAMISTS' CORNER.

THE USE OF PYROMETERS IN THE CERAMIC INDUSTRY

J. W. Lazear.*

THE PYROMETER, as you are probably aware, is an instrument used to measure high temperatures.

The first practical pyrometer was devised in 1782 by Wedgewood, the celebrated English potter, for use in operating his kilns in the burning of his fine china and earthenware. He succeeded in making an instrument based on the contraction of clay which was of considerable assistance to him and for probably fifty years was the only pyrometer known. This Wedgewood pyrometer is no longer used and has long been forgotten.

For a great many years attempts were made to measure temperatures by the different melting points of metal. For instance, if a rod of pure silver would just melt, the temperature was known to be about 1762 degrees Fahrenheit. At least this was a meager guide as melting points of most of the common metals are far apart and only the very expensive metals, such as platinum, gold, silver, etc., could be used at very high temperatures.

About forty years ago the manufacture of pyrometers, based on the difference in expansion of two metals, or expansion of one metal and non-expansion of another, was introduced.

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Gauntlett, in England, manufactured a pyrometer based on the greater expansion of brass and iron. The expansion pyrometer has been greatly improved in recent years and many of the unsatisfactory points in connection with the original instruments have been done away with. One of the most satisfactory expansion instruments is that dependent on the expansion of a steel stem and the almost non-expansion of graphite. Another type of expansion pyrometer, which has given very satisfactory results, is the quick-acting platinum pyrometer. This pyrometer differs from the instrument just described in that a thin strip of platinum is hung between heavy iron frames at the end of a stem, and when this stem is inserted in the heat, the thin strip expands instantly and reaches the total heat of the kiln in a very few seconds. The heavy iron frame meanwhile expands very slightly and about the time the platinum strip has reached, say, 2500 degrees Fahrenheit, the iron frame has only risen to several hundred degrees. This instrument indicates the difference in expansion of the heated platinum strip and the slightly heated iron frame.

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* The author read this paper before the last Illinois Clay Products Manufacturers' Association convention.

Today the most commonly used instruments for accurate measurement of high temperatures are known as thermo-electric pyrometers. This thermo-electric pyrometer consists of a thermo-couple formed of two wires of different alloys, and when these two wires are inserted in the heat, a slight current of electricity is generated. The current, or milli-volts, generated by this thermo-couple is sufficient to operate an electrical instrument, or milli-voltmeter. As the temperature of the thermo-couple rises and falls the thermo-electric current increases or decreases and is indicated on the instrument, which is graduated in degrees of temperature.

Wires to form the thermo-couple of dissimilar metals must be carefully chosen, and for use by the ceramic industry the most satisfactory thermo-couple is composed of one wire of chemically pure platinum and the other of platinum and 10 per cent. rhodium, the wires being insulated with small fire clay insulators and enclosed in an outer porcelain tube which is impervious to gases to protect the platinum from being destroyed by the action of gases at high temperatures.

There are two types of electric pyrometers, the low resistance type and the high resistance. The high resistance pyrometer is recognized as being the most accurate, as the internal resistance being so high the instrument is in no way affected by the changes in lengths of wire, or temperature of wire connecting the thermo-couple, which is inserted in the kiln, and the instrument.

You have no doubt noticed the rapid adoption of pyrometers in the clay industry to accurately control the temperature in burning brick, tile, sewer pipe and terra cotta. Where five years ago nothing but a portable pyrometer, to be carried around the plant, was used, today the progressive plants have permanent pyrometer installations on the kilns, by means of which the temperature can be read at any time by the burner, and recording instruments keep a constant record of the temperature day and night in the office.

The reason pyrometers are such a paying proposition is that it practically eliminates all guess work.

You have, without doubt, often thought as you watched some poorly burnt ware being removed from a kiln that there ought to be some way that you could be sure that the proper temperature was being carried on the kiln, so that this loss in poorly burnt or bursted ware could be prevented. You have wondered why it is that the brick or tile from the last kiln fired was first-class, while there is a loss of at least ten per cent. in the kiln just burnt off.

You have thought as you watched coal being shoveled in a kiln that there must be a lot of fuel going to waste on account of an excessive temperature being maintained at times. You have wondered whether the burner, who is paid for being on the job, is forgetting to fire the kilns at times during the night, with the result that the temperature has dropped off badly, with no benefit to the ware, and an excessive amount of fuel is shoveled on to get the temperature up again before morning.

In other words, you have been simply guessing at the trouble and, unlike many progressive works, you have no absolute control over your kilns or the results they show.

Suppose you have the pyrometer in use. There is no cause for poorly burnt ware in the future, for if a certain temperature at each hour of the burn produces a perfect burn, these same perfect results can be reproduced any number of times by maintaining the same temperature at each period of the burn. There is no excess of fuel used, as the temperature is not carried at a higher point during the burn than is required.

If you have a recording pyrometer in use you do not have to wonder what temperature was carried on the kilns during the night, as a record has been traced day and night on a chart. The carelessness of the poor burner is shown up, whereas a good burner shows up to advantage. The moral effect of a recording instrument under lock and key is no small matter. The feeling of the manager or superintendent who actually knows what is going on at the plant, and whether the kilns are being properly fired, is much better than the one who is working in the dark.

When a pyrometer has been in use a short time, it is usually found that by increasing the temperature a little more rapidly the length of the burn can be shortened without affecting the ware, frequently several hours with a consequent saving in labor, time and fuel.

As before mentioned, it should be clearly understood that with the electric pyrometer no electric current, or batteries, are necessary to operate the pyrometer, the thermo-couple itself generating a small current of electricity proportionate to the temperature to which it is heated.

In the ceramic industry, cones having various degrees of fusibility are used. These cones have a tendency to curl over when certain temperatures are reached but, of course, are valueless to show whether the temperature has fallen. Strictly speaking, these cones are not a pyrometer, so their fusing point is affected very largely by both time and heat. A cone burning 50 hours in a brick kiln will take 50 degrees or more heat to bring it down or fuse it than a cone in a test kiln heated up in several hours. This is attested to in a paper read by Samuel Geijsbeek, of Portland, Oregon, before the American Ceramic Society held in Chicago in March, 1912.

The purpose of a pyrometer is, primarily, to aid the burner in maintaining uniform temperatures during the entire burn, and secondarily, to keep the manager or superintendent in touch with the operations of each burner on both day and night shifts, as shown by the recording instrument which is located in the office at a distance.

I wish to summarize in a brief way the principal results obtained by a pyrometer, directly or indirectly, in the practical operation of a clay plant.

The first, and practically most essential point is that a uniform temperature can be maintained in the kilns and this is absolutely impossible to obtain without a pyrometer.

Second. The burner can operate his kilns more carefully, with a constant and accessible indication of the temperature in the various parts of the kiln.

Third. The continuous record of temperatures carried on each kiln by night, as well as day shifts, in the office where the superintendent or manager may find ready reference, is of untold value.

Fourth. A better knowledge of the exact temperatures found in various parts of the kiln becomes very useful, and the extended use of a pyrometer in operating all the kilns in a plant under given temperature for a considerable period of time, and consequently under other known temperatures for sufficient time, has proven of great value in determining the practical range of temperature for good operating conditions in the burning of clay products.

In order to get the best results from your kilns it is necessary that a determination be made of:

a. The most efficient temperature to maintain in the burning of your kilns.

b. The effects of carrying other temperatures.

c. The range of temperature that is practical.

d. The elimination of theoratic operations or the method of gauging temperatures by the eye.

These results can be secured by the installation of a pyrometer system so that:

a. The superintendent or manager, while at his desk in the office, may always be in touch with the operations of the kilns.

b. The burners may readily watch and control the temperature in various parts of the kilns.

The imported high resistance pyrometer, which was really the only one supplied until a few years ago, was a very delicate instrument which was mainly practical for laboratory use and to be handled by scientific men, but the high resistance instruments that are today manufactured in this country are very rugged and have been designed mainly for use by practical as well as scientific men.

Like automobiles, pyrometers have been constantly improved upon and today are not considered as an experimental proposition but have proven of great value wherever installed. This can be attested to by the fact that most of the clay manufacturers in this country are equipped with permanent pyrometer installations and those concerns who have not been progressive are still burning their kilns as their great grandparents did. Only those concerns who are more progressive than their competitors in the adoption of modern equipment will be able to compete in these days of severe competition.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY WORKER.

CHAPTER I.

A CLAY IS NOT a mineral in a strict sense of the term mineral but instead is a complex mixture of minerals.

In order to carry out the burning process intelligently we should have some understanding of the minerals with which we are dealing and their behavior under fire.

Each clay is a separate problem because it differs from other clays in its mineral content. The same mineral in different clays does not give the same effect in each. Iron, for instance, may produce a deep red color even through a long vitrification range; it may develop a deep red changing to a dark brown; the color may be a pale red or even a buff at certain temperatures while at higher temperatures the ware may become peppered with black iron spots; associated with lime it may produce a pale red at low temperatures, a buff at medium temperatures, and a green at high temperatures. The amount of iron may be the same in each case and the different results are due to the chemical and physical character of the iron minerals and their reaction with associated minerals.

The common base of all clays is kaolinite, a hydrated silicate of alumina. There are other hydrated silicates which closely resemble kaolinite in their physical properties, particularly plasticity, but so far as our burning problems are concerned we need only consider kaolinite.

Kaolinite comes from the disintegration of crystalline rocks, especially feldspar. The latter is a silicate of alumina with some base, such as potash, soda, lime, magnesia, iron, etc. In the disintegration process, silica in part is set free, kaolinite is formed, and the base is set free to combine with some acid radical to form sulphates, carbonates, etc.

Kaolinite is considered a final product from the disintegration of feldspar, but there is evidence to show that under conditions not now understood, kaolinite is disintegrated to form bauxite (hydrated alumina) and silica. From the pure feldspar, then, we have several derived minerals any or all of which may be found in the clay mass, but feldspar is only a part, often a very small part, of crystalline rocks.

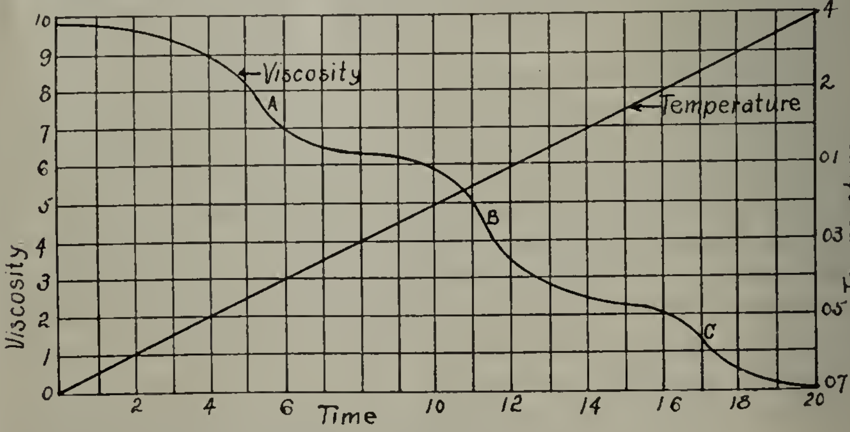
It is associated with quartz, mica, hornblendes, augite, and a long series of other minerals, usually complex, which disintegrate to form other derivative minerals, and all of these minerals, both original and derived, may be found in the clay body.

Finally, as the resulting minerals are washed from their source to their final resting place, they are not only undergoing mineralogical changes, but they are being sifted and sorted by moving water and deposited as sands and clays, or on the contrary, perhaps, they are being mixed with the waste from other sources and the complexity of the mass increased to develop into trouble for the clayworker. On the one hand we may have pure kaolin and on the other common clay, and between there will be all gradations from the one to the other.

Nor is the story fully told—it is too long to tell here—since the development of the mineral mass we call clay only begins with the disintegration of the rocks. The deposits may gradually build up in water teeming with life the remains of which go into the clay bed to be reckoned with later in our kiln problems; they may subsequently become land surfaces covered with vegetable growth; again be buried to great depths and hardened by heat and pressure, the vegetable matter converted into lignite, coal, graphite, and the pores of the clay mass filled with the distillates of the animal and vegetable remains; again come to the surface by some wrinkle in the earth's crust, be eroded and removed to other locations.

A flood from the north may bring one bed, superimposed by a bed left by a flood from the east, and this covered by a flood deposit from the west, each bed perhaps widely different. Not only will the beds be one above the other but each succeeding flood may cut gullies in the beds already deposited and fill them with its material.

The clays when deeply buried and subjected to pressure and heat are converted into shales but without losing any of their properties; under greater pressure and heat the shales become schists and slate and lose their plasticity which is of first importance to the clayworker. This property is largely irrevocably lost and the schists where exposed crop out as massive rocks. Many of them, however, still contain the remnants of the original clay-forming minerals and these are being decomposed to break down the schists and give to



No. 1.

them some measure of plasticity which they must have to be useful to the clayworker.

Ground waters are circulating through the clay beds purifying some and defiling others. Iron minerals are being disintegrated and the iron converted into oxides, sulphites, sulphates, and carbonates; lime, magnesia and the alkalies are being changed into sulphates and carbonates.

Geologists have never given us a satisfactory theory to explain the buff burning and refractory clays found in the coal measures.

The latest theory is that advanced by Mr. Wilber Stout, of the Ohio Geological Survey, in Vol. XVII, Transactions of the American Ceramic Society. The theory in brief is that coal beds have completely oxidized and the remaining ash hydrated which would give a clay having the composition of coal ash.

It would seem as if everything in nature leads up to clay or plays a part in the development of clay.

The clayworker's problem is to take these clays, unlimited in their variations, and burn them into a limited number of wares. He is dealing with materials the fusion temperature of which vary from cone 010 to cone 42.

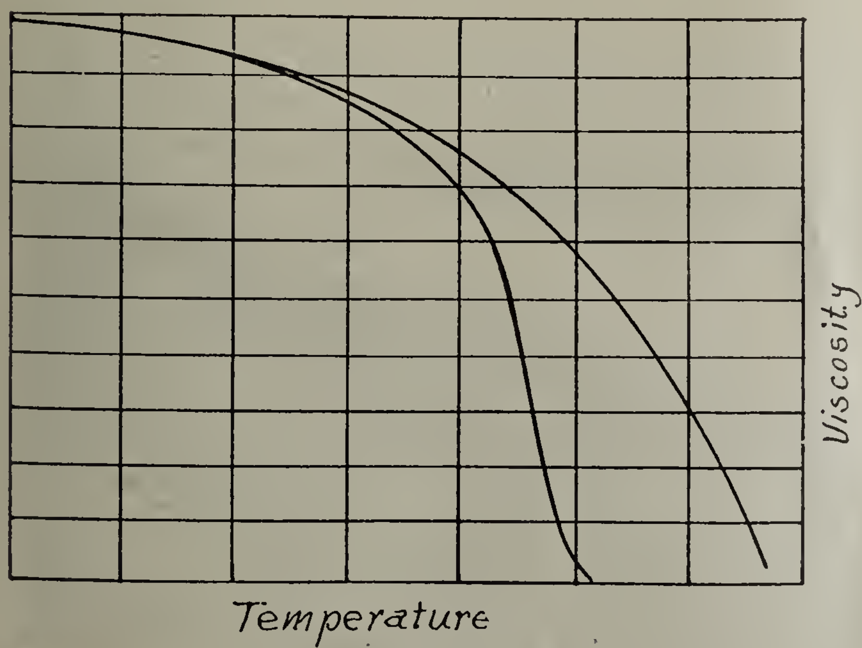
Fluxes and Eutectics.

The common conception of a flux is that of an easily fusible chemical or salt which melts at a low temperature and dissolves the refractory materials to be fused, either with or without chemical reactions although chemical combination frequently takes place resulting in the formation of a different compound or mineral.

We have considered the potash, etc., in minerals as the flux but the study of solutions has developed results which compel us to modify our original conceptions. It is the mineral that is the flux and not the mineral content considered separately, moreover, the fluxing effect is due to an intimate mixture of the minerals to be fused. Feldspar, mica, etc., will act as fluxes at the fusing temperature of these minerals, but they will do more than this if finely ground and intimately mixed with the minerals to be fluxed, namely, they will act as fluxes at temperatures below their fusion point.

As has been shown by Seger and others, if we mix kaolin and silica we develop without any flux a mixture more fusible than either alone. With successive additions of silica to kaolin the fusion temperature drops from cone 35 to about cone 26 but further additions increase the temperature requirement. This minimum fusion point is called the eutectic and the mixture which fuses at the minimum temperature is the eutectic mixture.

In this mixture there is no flux as the term commonly implies but the mixture itself acts as a flux. In any mixture of kaolin and silica some part of it will be in the eutectic proportion and this will start the fusion.



No. 2.

The most fusible mixture in a clay body, regardless of the content of a fluxing salt, such as potash, is the flux, and while this mixture may contain the alkalies it does not necessarily contain all the alkalies in the clay mass; indeed it may contain a very small part of them.

The fluxes in a clay body are not potash, soda, lime, iron, etc., but instead they are more or less complex minerals and mixtures of minerals.

The bases are a part of these minerals and enter into the mixtures, and, no doubt, aid in developing more fusible eutectic mixtures but as constituents of minerals which do not enter into the fusible mixture they play no part in the fusion.

Paving bricks which we class as vitrified often come through the kiln heavily scummed and the lime in the scum though an active flux under certain conditions had no part in the fusion which produced the vitrification.

In the form of an oxide the lime undoubtedly would have been a part of the fused matrix but as a sulphate it remains free to appear as scum.

Mica is often seen in well burned bricks and its fusible base has not entered into the fused matrix which makes the bond.

Potash, soda, and magnesia are found in wall efflorescence and there is ample evidence to show that they come from the clay ware. They are fusible at very low temperatures and we often wonder how they could have escaped the fire influence. It is likely that the heat has effected some of the minerals which did not enter into the fusion and that in consequence they disintegrate under weather influence thus setting free the base to develop efflorescence, and it is also likely that some of the fused matrix is not stable and similarly disintegrates. The leaching out of these bases has no appreciable effect on the bond of the ware and if it has none whatever, which remains to be proven, then we must conclude that the bases in the efflorescence come from minerals which were not a part of the fused matrix. A mineralogical examination of vitrified ware will undoubtedly reveal a number of minerals, containing alkalies, which have not become a part of the fused matrix.

An important factor in fusible mixtures is a fine state of division and intimate association of the minerals.

Two clays may be chemically and mineralogically identical yet behave widely different in the burning.

In the one all the minerals may be in a fine state of division and thoroughly mixed and the action of one mineral upon the other in a maximum degree is possible, while in the other, all or any one of the minerals may be in coarse fragments which would prevent the close association essential to the development of a mixture fusible at a lower temperature than any of the minerals.

Some minerals develop more than one eutectic mixture. The addition of one to the other in increasing amounts lowers the fusion point to a certain minimum. Further additions raises the fusion point for a period after which continued additions again lowers the fusion point to a second eutectic followed by a second rise.

In clay wares we do not have mixtures of simple minerals with which it is possible to determine the eutectic points. If we could plot the eutectic points in terms of temperature and viscosity we would find sudden drops in the viscosity curve as illustrated in the following assumed curve, No. 1.

The temperature would increase perhaps in a straight line. The viscosity with the beginning of fusion would be very high and would decrease with increase of temperature but not in a straight line nor in a uniform curve. As eutectic points "A," "B" and "C" were approached there would be a

(Continued on page 728.)

SURFACING BRIDGES

By
Frank·R·Lander

Frank R. Lander's service as county engineer of Cuyahoga County, Ohio, forms a milestone in the history of the county. He extended and perfected the policy which has made Cuyahoga County the best paved rural district in the world, a policy which is being ably continued by his successor He also undertook several monumental bridge projects, some features of which he discusses in this article.—Editor Dependable Highway.

WHAT I THINK of brick for paving the roadway of bridges is best exemplified by the bridges built in Cuyahoga county during my term as county engineer. Our experience with brick as a material for county road improvement had been so favorable that it naturally had first consideration when we came to decide upon a flooring for bridges. In no cases was this first judgment reversed, and in no case has experience failed to justify our choice.

Several of our bridge jobs were noteworthy. We built the Denison-Harvard bridge, a high level structure across the upper Cuyahoga Valley which saves fourteen miles of car riding to a large number of citizens. This bridge is of steel with a total length of 3,000 feet. We also built the Rocky river bridge at the terminal of the Detroit avenue car lines, which affords the Detroit suburban lines access to the city. This bridge was of novel design and at the time of its construction had the longest unreinforced arch in the world. Several jobs of lesser cost entailed novel difficulties or embraced new features of design.

Brick, in my opinion, is the best for bridge floorings, because in a majority of situations it represents better value per dollar of expenditure than do other paving materials. It insures a clean, level, lasting surface that will withstand the extremes of both traffic and weather. The only practical limits to the use of brick on bridges which I recognized were, on one hand, the heavily traveled viaduct in the heart of the city and on the other the light rural bridge that has only occasional traffic. On the latter a plank floor will suffice for many years.

On the former, as exemplified in the new superior viaduct, I planned to use granite block. The structure has not yet been completed and the question of paving material is in the hands of my successor.

For practically every structure that is not light enough for a plank roadway, I would use brick and build substantially enough to carry such a surface. Those who differ from me in this regard usually make a point of the weight question. By using wood blocks soaked in an inflammable material they effect a saving in the weight and consequent cost of the bridge, but this saving, in my opinion, represents doubtful economy. A fire on a bridge is difficult and dangerous to deal with. The heat of a flaming roadway will destroy a powerful steel structure. There have been instances enough of just this result to make the use of fireproof materials decidedly preferable.

A bridge should be paved just as a roadway is paved, excepting that the expansion question requires special attention.

In an ordinary pavement we have to deal only with the expansion of the brick. In a bridge we must deal with the expansion and contraction of the bridge itself. Under certain conditions, this reduces the problem, because if the ex-

Typical Steel Bridge In Cuyahoga County Ohio.

pansion of the bridge and pavement happens to be identical there is no need for an expansion joint. The degree of expansion in brick, in steel structures and in concrete is not so different, but the brick being in the most exposed position is first to feel the effects of a change of temperature. This difference of time is less marked in the steel bridge and more distinctly marked in the concrete or stone bridge on account of its greater mass.

Because a bridge pavement is always in an exposed position and because the counter or compensating thermic changes in the bridge cannot be fully anticipated, I have regarded it as good caution to provide ample expansion joints in bridge pavements. I would confine them to the longitudinal position along the curbs, but wherever the width of pavement is large enough to make excess expansion an issue, I would double the thickness of the expansion joints.

The bridge in most cases provides a suitable base for a brick pavement. In the Denison-Harvard bridge we laid reinforced concrete between the floor beams, bringing it to the level of the upper flange of the beam at the gutters and crowning it slightly at the center. On this we placed the sand cushion to support the brick. With a concrete bridge, the only thing necessary is to bring the upper surface of the concrete fill to a proper grade and crown in order to have a suitable base for the pavement.

The Denison Harvard Bridge, a Seven-Hundred-Foot Viaduct, Paved with Brick.

What I have said about brick paving, of course, applies only to such pavement as is properly constructed, with a uniform base, rolled sand cushion, expansion joints and grout filler. It is only through intelligent attention to these details that the full possibilities of brick paving can be realized and those who fail to realize its excellence have usually encountered it under faulty conditions of construction.

The burner of clay products would seem to have enough complication to contend with aside from the matter of smokeless combustion, but the smoke prevention folks are asking the industry to wrestle with that question, too. Fortunately smoke reduction generally means better combustion and that helps some economically.

IMMIGRATION.

We have gained virtually no population from abroad for more than a year. Some people think that condition will continue indefinitely after the war, because of war's destruction of labor power; because there will be a great demand for labor in Europe to rehabilitate industries; because nations from which we have drawn many laborers, notably Austra-Hungary and Italy, are likely to restrict or prohibit immigration.

That would be like cutting off a supply of raw material upon which our industries depended. For a dozen years before 1914 we drew an average of nearly a million immigrants annually. They fed our expanding steel mills, and so on. We cannot expand industrially without a continually expanding supply of labor. Just now employers in many lines are hunting high and low for men and not finding as many as they want.

But look at Europe. England alone, with about four million prime workmen withdrawn from normal production, is producing quite as much as ever. Germany, France, Russia and Austria are in the same state.

Suppose stoppage of immigration puts us to something like the same test. Undoubtedly there are immense reserves of labor power here—to some extent on account of idleness, but far more because much labor is employed at low efficiency. For example, there is a great quantity of black labor in the South that might be much more productive than it is. Suppose we were obliged to search out and use to the best advantage all the labor power we have. That would be no calamity.

Others hold that there will be a tremendous inflow of labor after the war. You can take your choice of the two guesses. But, with a complete stoppage of immigration industrial expansion is still possible—"Saturday Evening Post."

THE CLAYWORKER AND THE CLAY SCHOOLS.

THE PURPOSE of the present article is to call attention to various phrases of the relation or connection between the schools of the country and the clayworking industry, with the idea in view of arousing a livelier interest, both on the part of those in charge of and attending schools and the clayworking fraternity, to the end that there may be developed a still closer relation beneficial to all.

The original interest leading to a closer connection between schools and clayworking came from a recognition on the part of the clayworkers of the need of scientific training and of courses of study in the analysis and treatment of clays. In this work the schools of the country which have inaugurated courses of study in ceramics have contributed wonderfully to the progress of the clayworking industry, and the benefits of the schooling have been so readily apparent that the clayworking industry has naturally encouraged this phase of the connection with the result that today we have a fair number of schools throughout the country which perform two distinct services for the clayworking industry. The primary service of importance is that of training young men and in qualifying them technically for the business. The other service, which was developed incidentally, but is an important service just the same, is that of analyzing and testing clays, which work, of course, is carried on as a part of the course in schooling.

Mention was made of this phase of school work, editorially, in The Clay-Worker recently, in which it was pointed out that a good many years ago the Ohio State University, of Columbus, put in equipment and took up this phase of the work. Since that time other schools have taken up the work, so that, in addition to the Ohio State University, among those that can be named off-hand as doing good work along this line are the Illinois State University, Champaign, Ill.; New York State School, Alfred, N. Y.; Iowa State College, Ames, Iowa, and the New Jersey State College, New Brunswick, N. J. Moreover, that there is an active desire among these schools to enlarge and build up still more the study of clayworking is evidenced by the fact that from time to time some of them are to be found among the advertisers of The Clay-Worker, setting forth an outline of their equipment and bidding for students interested in clayworking.

It is not only up to the clayworking industry to give heed to these things, but it is a part of the duty of the fraternity to lend active encouragement wherever possible to the further development of ceramic branches among the schools of the country ,for we need more young men trained in the science of clayworking, and since this training includes clay testing as a part of the work, it increases the facilities for the clayworkers all over the country to get tests made of any new clay openings they may desire to experiment with. This phase of the question between the clayworkers and schools is fairly well understood, however, and perhaps more generally appreciated and encouraged than some other phases, therefore, it is the intention to turn aside now and take up a side of this connection that heretofore has not been very extensively discussed.

There is before the writer now a new story sketch by William Allen White, in the Saturday Evening Post, dealing with boyhood, in which he describes a bunch of boys as follows:

"They were twelve, thirteen and fourteen and full of the joy that washes into life with the first full tide of growth. At the Manual they had been making things with their hands in wood and iron and stone. Creation seemed good to them. And they talked, making their tomorrow a kind of exalted yesterday, which is the way of youth."

Here, conscipuous because of its absence, may be found a phase of this subject that needs more attention than it has been getting, and that is the doing of things with clay and clay products in schools other than and aside from those advanced studies of ceramics. Nearly every boy, at nearly every school, today is being taught to work with wood, and where there is anything like a pretentious manual equipment there is included work with brass and iron, not only in working and shaping, but often in melting and molding. There is also included work in stone, but everywhere all around us clay products are too conspicuous by their absence from just such places as this. Therefore, that is what we need more of—we need more clay products in the schools and more attention to developing the interest of the youngsters in them during the early days of the higher school life.

The clayworking industry has fostered and encouraged trade schools and especially those which have branches devoted to brick paving and kindred lines. Now, then, it seems time for the industry to foster and encourage the trade of clayworking and the handling of clay products in all schools; not merely modeling in clay as is done by art branches, nor the science of clayworking and brickmaking as taught in the ceramic departments, but the practice and technology of bricklaying and the use of brick, tile and clay products, generally, for the various purposes to which they are adapted.

The subject will require some study and experiment to determine how it may best be handled. There is some chance for confusing the idea of this early high school familiarity with the still higher courses in engineering schools, where there is involved tests of brick and other building material in various ways. Brick and clay products should be encouraged in both these directions, but they can hardly both be handled in the same way as a single subject.

There is no doubt, however, but what more familiarity with clay products on the part of schoolboys in their earlier days will lead to a larger interest in the same subject when they go further and take up the engineering branches.

It should be practical to devise ways and means for making a place for clay products in school life, that part of school life where the preliminary manual training takes place, of the first introduction of the boy to many lines of physical work. The popular school idea of today is to have every boy apply himself a part of the time at physical work. Already there has been included in this the working of wood, which is fully as much of a delight to the average boy as it is an education. Then comes the working of metal, and now what we need is a working of or a working with clay products. The question it is desired to submit to both the clayworking industry and the schools of the country is, how may this best be brought about to the material benefit of both the schools and the clayworking industry.

There is no question but what more familiarity with clay products on the part of the youngster at school will result in a much greater interest in it not only later on in the school life but in after life and in building operations and street paving and in all branches of industry and development where clay products can be used. The question right now is, how can we get more clay products into the schools in a manner which will be interesting and useful?

Many schools with plenty of ground space should be able to have exercises or training in the laying of brick, the setting of tile, the putting on of roofing tile, the installation of floor and wall tile, fire-place and hearth work, and many interesting things of that kind. Then there comes terra cotta and the art work in clay products or the decorated ware. Also, there is the pottery branch, including everything from the making of simple flower pots to decorated ware, and surely some of this work may be included in the manual training branches and prove of both interest and value.

It is a big subject and it involves some interesting questions, some of which are rather puzzling. For that reason, it is desired to ask opinions on the subject after merely advancing the idea here, both from the clayworkers and those in charge of schools. What can be done to bring clay products into more interesting prominence in the manual training department of schools and how? That is the question—what do you think of it?

QUESTIONS OF INTEREST TO CLAYWORKERS

ANSWERED BY J. J. KOCH.

BURNING AND SALT GLAZING TILE.

We are comparatively new in the brick business and would like some information in regard to burning and also in regard to salt glazing. Is there any way of making a tile a darker red without burning them harder? What is the proper method of burning tile hard without overburning the top of the kiln? We burn in down-draft kilns, and would like to know the best method of salt glazing so as to reach the bottom of the kiln and obtain a uniform glaze. Is there anything used beside salt in glazing?

Without having a closer insight into the qualifications of your clay, the questions you ask can only be replied to in a general way. In the first place, all kinds of clays will not take a salt glaze, as any clay to salt glaze must contain between the maximum and minimum percentage of silica and alumina, which in turn is slightly modified by other salts being present in the clay—which salts add to the more rapid salt-glazing—such modifying salts generally coming to the surface of the ware during the drying and burning stages If the fuel used in these operations contain sulphur, the vapors of which can come in contact with the ware, then such resultant scum must be subjected to reducing conditions, so that the sulphur will be freed to pass off, and the resultant skin will then aid glazing. Should such sulphur compound not be freed from their sulphur content, then they will act as a veil and prevent the formation of a salt-glaze, by it not being able to come into contact with the ware.

The question of proper temperature is of vital importance, for the temperature of initial volatilization is not enough to insure decomposition of the volatilized salt, then upon cooling the salt will deposit as salt without producing a proper glaze. Often times the temperature may be high enough in the fireboxes, where the salt is volatilized, while the ware itself may not be hot enough to let the salt take a hold; then, again, the ware itself may not stand up under the required necessary temperature; thus, often times, a mixture of clays must be resorted to, so as to make the mass suitable for salt-glazing. Yet, with all that, there are a great number of clays and shales suitable for salt-glazing, although it seems to be rather an expensive way to make drain tile suitable for service by salt-glazing. Of course, the modern tendency is to burn drain tile harder than formerly, to overcome the temptation to market unburned tile, which are liable to rapid ruination by the soil acids, and it has also been demonstrated that the hard burnt tile will practically pass as much water as an underburned (softer) tile for the water passage through the slit where the hard burnt tile abutt, is a practical equivalent to the porosity suction of the softer burned tile.

As a general thing the color of red-burning ware is dependent upon the percentage of iron it contains and the temperature to which the ware may be subjected. The red iron color, however, being modified by the percentage of alkaline earths present; these in turn again being governed by the type of fuel. For instance, a certain clay may contain lime enough to mask the iron color, when using a fuel containing no sulphur, yet this clay may develop the most brilliant red when a fuel is used high in sulphur (under oxidizing conditions), as this sulphur compound under oxidizing conditions cannot have any influence on the iron red.

However, the color of iron-content clays may be governed by the character of the fire, as, for instance, reducing action thereof, turns the iron black; continued oxidizing conditions, subject to higher or lower temperatures, can produce from light red to a deep dark purple, and alternating reducing and oxidizing heat may produce brown, as mixtures of red and black are apt to produce brown. Slip clays containing sufficient iron and proper fluxes, used on drain tile, are very apt to produce darker colors.

Proper draft-setting and flues in good proportion are the essentials in salt-glazing ware, always assuming your material will stand up under the requisite heat. There is not much of a trick in salt-glazing, provided the draft is regulated properly, so that the heat can be drawn to the floor, so that the ware there will be of a temperature high enough to take salt glaze. With a clean fire when spreading salt, the glaze is apt to be clear, but when using a smoky fire, the glaze is apt to be dark. This latter method is often used in glazing sewer pipe, because the user oftentimes thinks that light colored sewer pipe is underburned and dark pipe is more serviceable, when, in reality, color is of no importance, as the value of sewer pipe is governed by the resistance of the body and glaze to ware, and the later teachings are that glaze will wear off by friction and does not determine the life of a sewer pipe, whereas, if the body is thoroughly vitrified, the sewer pipe is assured of a long life. Some engineers now sandblast the glaze, and such a piece of pipe is subject to absorption test, and arbitrary limits of absorption are used as a standard, to compare the relative value of submitted sewer pipe samples. One thing is sure, the writer has seen sewer pipe with a beautiful glaze, which, when submitted to such a test, conclusively showed their worthlessness.

Oftentimes drain tile clay is mixed with manganeze pulp to produce a darker color, leaning toward the browns. Iron salts, mixed with the original clay, has a tendency to intensify the iron color, and with increase of temperature it is easier to make the darker shades. Probably the simplest way would be to mix your clay with some clay containing a larger percentage of iron, as iron salts suitable for the desired purpose are expensive, and the cost may prevent their use.

THE BRICK WALK.

The present year should bring with it some progress toward the return of the brick walk, especially on private property. Perhaps we will never have the old brick walk in its exact original form, but we can certainly have a more extended use of brick and burned clay in landscape architecture and especially in the walks surrounding the home. There is a great cry for color, for something to get away from the monotony of concrete. Already this cry has resulted in an extensive use of brick in constructing porches, foundations and parapet walls. Also, there was, during the past year or two, quite a free use of brick for edging concrete walks and steps and even this is not all that was desired. There is a feeling among architects that we need a more extensive use of brick around the house, consequently there is a natural disposition toward using it both for walk borders and the walks themselves on private property. In some instances it will probably take on the form of special tile for the walk itself. In other instances, selecting and setting of brick pretty much as paving brick is selected and set, but whatever variety or form manifests itself, one thing easily evident is a splendid opportunity to develop a more extensive use of brick and burned clay generally in the fitting out of walks around houses and porches and in landscape architecture generally. We hope the trade will take advantage of the present opportunity and do some experimenting so as to be prepared to exploit ideas looking to a larger use of brick and tile for this purpose.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE BUILDING SITUATION on the Pacific Coast is holding up pretty well, though there is no special boom anywhere. All classes of clay products are in good demand, and in most cases there have been advances in price on account of increased manufacturing costs, due to the higher prices of fuel and materials of different sorts. Contractors are not as much inclined to ruinous competition as formerly, the uncertainty of the material markets being an effective bar to wild risks. In the cities there is evident an encouraging amount of business block building, but the chief building activity is on industrial plants, dwellings, schools and municipal structures. Brick is being used more than last year by a wide margin, and brick and concrete construction in combination seems to be giving satisfaction. The brick plants on the coast are practically all operating full force in order to make the most of the summer season, yet surplus stocks in some yards are reported to be getting low.

The paving brick industry has been given much attention in California in late years and numberless experiments have been made by local manufacturers. The difficulty has been to obtain the right kind of shale and other materials necessary for a hard brick. Now it appears that deposits of shale of the requisite qualities are being developed and a brick of the highest standard is being produced. The popularity of vitrified brick paving is assured once the merits of this class of paving is amply demonstrated and the price made cheap enough. Certain blocks in San Francisco have been paved with brick and submitted to unusually severe traffic tests, and these paved sections have held up remarkably in spite of neglect. The city has not taken pains to keep these pavements in good repair. Soft brick have not been removed promptly, and as a result the paving has not had the best chance to show its wearing qualities.

The vitrified sewer pipe business is better than a year ago, but as yet hardly up to the average of years past. Municipal sanitary improvements are going ahead a little better, and many new sewer extensions are being planned, but there is only a very limited amount of suburban tract work under way. This class of work formerly called for much sewer pipe.

Terra cotta products are costing more to produce and higher prices are being charged in general, yet the demand is better than last year and the outlook encouraging. Hollow tile is being pushed by the manufacturers and this type of construction material is certainly growing in demand. Fancy terra cotta products are being specified quite generally for ornamental trimmings, and terra cotta garden pottery is popular.

By reason of confusion of details in her building regulations, the city of Los Angeles has had drafted a new building code which simplifies matters very much. A commission has been engaged for two years redrafting the building ordinance and now it is ready for consideration by the city council. While the new building code, as drafted by the commission, contains some new features affecting construction, the main advantage is the arrangement and classification of what was a most confusing mass of amendments, clauses and other changes. Now the desired information in regard to building a structure of any class can be ascertained with a minimum of effort. The new code will permit the use of hollow terra cotta tile for exterior walls in a Class A, B or C building, outside certain fire limits and under specified conditions. Considerable space is accorded to hollow tile construction work.

The Port Costa Brick Works is busy this month supplying brick for the new wings to the County Hospital in San Francisco. The contract calls for 3,500,000 common brick.

Howard Frost and Gust Larson, of the Los Angeles Pressed Brick Co., were up from headquarters in Los Angeles this month.

F. A. Turton, president of the Refractory Magnesite Co., office in the First National Bank building, San Francisco, states that the demand for the company's products has extended as far east as Pittsburg. The plant of the company is at Preston, Cal.

The California Paving Brick Co. has been working for three years perfecting a high-grade vitrified paving brick and the latest products produced have proven so satisfactory that plans are being prepared for manufacture on a much larger scale. The company has enormous deposits of Canton shale in Calavaras county, and also silica and other raw materials, and it is the purpose to manufacture the brick at Valley Springs, near the deposits. The United Railroads at San Francisco have been using the company's brick for track work with splendid results, and now the city of Oakland is going to use 40,000 on street experiments.

The California Pottery Co., which is under the same management as the California Paving Brick Co., is very busy at the plant in Oakland. So steady is the demand for terra cotta products that the fires at the plant, says Mr. Prichard, the manager, have not been out for over five years. The company has a specially good business on sewer pipe, drain tile, flue linings, patent terra cotta chimneys and garden pottery.

The Atlas Brick Co., whose plant has been shut down, is preparing to resume operations on a considerable scale. The plant is located in the Potrero district of San Francisco. Paving brick is manufactured from material taken from the immediate vicinity.

Henry Dreishmeyer, a pioneer brick manufacturer of Santa Clara county, died at his home in San Jose on May 25, at the age of seventy-six years. He established the first brick kiln in the county and was well known in the California trade. He is survived by a widow and four sons.

At the recent annual election of the Los Angeles Builders' Exchange, W. R. Simons, president of the Simons Brick Co., was elected second vice-president.

According to the statement of Walter W. Bradley, mining statistician of the California mining bureau, Los Angeles county ranks first in the output of brick and crushed rock. Mr. Bradley is compiling information of the mineral production of the state.

It is reported by George Wapple, of Yuba City, that the old Swain & Hudson brickyard at Marysville, Cal., is soon to be opened if certain plans do not miscarry.

W. W. Childs, who was manager of the Remillard Brick Co., of Oakland, for thirty years, died the latter part of May. He left a widow and three sons.

SUNSET.

San Francisco, Cal.

FRANK BUTTERWORTH MEETS WITH ACCIDENT WHILE PLAYING GOLF.

An unusual misfortune befell Frank W. Butterworth, president of the Western Brick Company, Danville, Ill., recently, which for a time it was feared would cause the loss of his sight. A ball struck by another player glanced and hit Mr. Butterworth in the face, breaking his eye glasses, particles of the glass pierced the eye and it was feared at first that his eyesight was destroyed, but such did not prove the case, and Mr. Butterworth writes under date of June 16 that he is in a fair way to recover with no serious results from the accident.

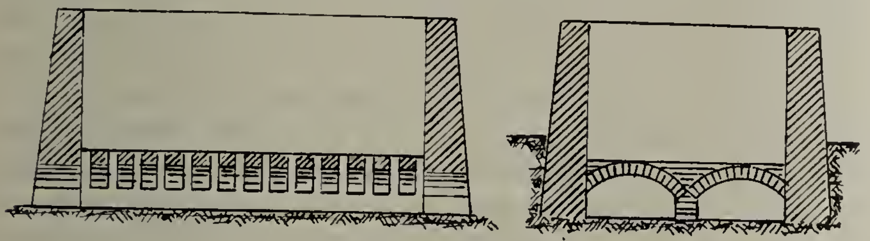
NEW USE FOR PAVING BRICK.

As the result of an accident to a youth who was injured by diving into a stone in the municipal swimming pond at Topeka, Kan., a local paper states that the pond will be drained and the bottom of it covered with paving brick. As an added safety, the park officials would do well to forbid high diving, except by experts.

FOREIGN SCRAPINGS

Servian Brick Industry.—The clay industry in Servia, while not extensive, is nevertheless conducted along up-to-date methods. The clay found there is well adapted for the making of clayware, and there are a great many small clay-plants everywhere. The clay is only used from 6 to 10 feet from the surface. The clamp kilns are of a special design and the fire boxes and flues are underneath the bottom of the kiln. The kiln is about half the height in the ground, and the results are fairly uniform in burning. The larger plants have all steam machines, and many have continuous kilns.

Brick Setting in Open Kilns—In northern France, which is in possession of the Germans, there are many small brick-yards which are burning a very uniform brick. The cut herewith shown indicates how these brick are set, and shows that all flues are very uniform. The size brick is 8x3½x2½ inches, and it takes 19,840 pounds of coal to burn 100,000 brick. The open kilns built are 65 feet long, 32 feet wide and are set 45 courses high. In describing these kilns, a German soldier states that there were about half a million brick on hand when they took possession, and these brick are now used for street paving, railroad culvert work and for 21-centimeter cannon foundations.—Deut. Topf & Z. Z. No. 28-29, 1915.
—Deut. Topf & Z. Z., 19-20, 1916.



A Servian Kiln.

Heat Loss in Flues.—According to Mr. Quasebart the heat loss in under ground flues is considerable, and this is principly due to the fact that such flues are not constructed wits sufficient insulating material. The following table will give an idea of how great such loss can be, the data collected covered a long period of observation and a great number of installations.

Temperature at the inlet in degrees centigrade	Loss of temperature per foot of flue in degrees centigrade	Length of flue, equal to loss of 100 degrees centigrade
700-600	1.3 degree	90 feet
600-500	1.0 degree	105 feet
500-400	0.8 degree	128 feet
400-300	0.6 degree	160 feet
300-200	0.3 degree	320 feet

—Revue De Ceramique, No. 6, 1915.

Length of Mouthpiece of Brick Machine.—There are certain rules for the length of the mouthpiece of a brick machine, and one standard length for all clayware is an impossibility. The qualities of each clay are different, and unless these are studied closely, good results cannot be obtained. The breakage and cracking of most all clayware can be traced to the length of the mouthpiece. When the breakage amount to 5 per cent of the total, which is not much, and the yearly production is three million brick, which are sold for about $8.00 per 1000, then the yearly loss of broken brick amounts to $2,400.00. Many brickmakers should pay attention to this matter, for with $2400 he can do a great deal of experimenting, and it stands to reason that for a great deal lesser sum he will be able to adjust the length of his brick machine mouthpiece, so that the breakage will be overcome.
—Tonind Z. No. 136, 1915.

Nozzles on Auger Machines. It has been proved by experiments that one standard nozzle will not work on all clays. In auger machines the clay column runs faster in the center than at the sides, and there is a corresponding retarding movement from the center to the sides. Large openings in the die front give less resistance than small openings. These clay and auger movements should be studied properly and it is thereby quite possible to construct a nozzle and mouthpiece or die front which will give good results. Fig. 1 shows the top view of a die front having eight small openings. The center runs the fastest, with the side issue just coming out. Fig. 2 shows a double stream drain tile die, and what will happen when the clay does not run uniform. In Fig. 3 a three-stream end-cut brick column is shown. The center moves straight, but the two sides move in opposite directions. Fig. 4 is a cut through the auger and nozzle, and in which is shown that the clay at "A" does not move at all. Nozzles and die fronts should be made according to the outside diameter of the product to be formed; and if proper attention is paid to these points, better results will be obtained.—Deut. Topf & Z. Z. No. 87, 1915.

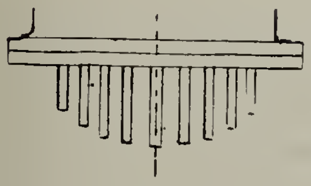


Fig. 1.

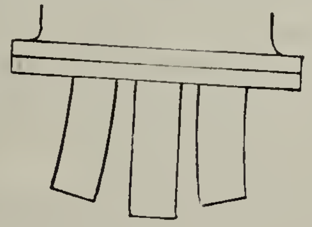


Fig. 3.

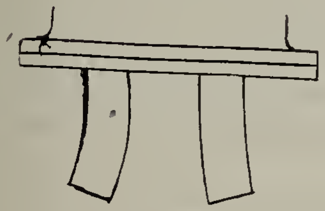


Fig. 2.

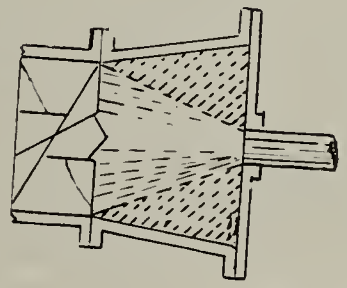


Fig. 4.

Dry Sheds for Clay Products.—The drying of clay ware is done by the moving of heat and air. If the clayworker has put this point good in his mind, he will have no trouble with his drying. But how many clayworks you find in which this idea is adhered to. The piling of brick close together is the worst feature of the whole drying process. The circulation of the air around the brick is entirely cut off, and then the clayworker wonders why his brick do not dry. In any case when the clayworker will solve his drying problems, he must first see to it that the air and heat can circulate around his brick.—Tonind. Z. No. 142, 1915.

Changes on Account of the War in English Clayworks.—Since the war began the manufacturing of sewer pipe, fire brick and other clay products in and around Cardiff have been reduced to such an extent that some of the works have been closed for the present. The cost of manufacturing has advanced from 40 to 50 per cent., which is mostly for the increased cost of labor. The selling cost is about the same, although there is a movement on foot to secure an advance in price from 30 to 40 per cent. Consul L. A. Lathrop reports that the demand for fire brick is below the normal, and that there is a general suspension of building of all kinds.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

BECAUSE OF A DEADLOCK among the builders' trades of Kansas City, building for the past two weeks has been almost at a standstill. But the various companies are again getting under operations and the city is issuing permits for the construction of many thousands of dollars worth of new brick building. One of the best things that the new administration has done in Kansas City is to form a new building code. The council passed an ordinance providing for a commission of three men, an engineer, an architect and an insurance expert, to act as a commission without pay. The commission will draft a new building code for the city and see that it is enforced.

The council of Kansas City also has provided for the repairing of the paving on all of the streets of Kansas City. This means that many million brick will be required for repairing and many million more brick will be required for the paving of the other streets for the first time.

Julius Osiier, of the Kansas City Symphony Orchestra, recently dedicated the D major symphony which was written by him, to the memory of Walter Grant Dickey, the son of Walter S. Dickey, of the Dickey Clay Company. Walter Grant Dickey was connected with the business of his father for several years and was well known in clayworking circles throughout the West.

Suits aggregating $125,000 were recently filed against Phil R. Toll, Louis L. Seibel and Alfred Toll by John C. Bronaugh, receiver for the Universal Clay Company. The suits are for stock subscribed in the company which the receiver alleges have not been paid. Mr. Toll characterizes the suits filed as "fictitious and without grounds." Mr. Toll recently said: "The stock issued to us in the Universal Clay Company was paid for. We have the cancelled checks to prove it. More than that, we have proved it in former suits. The whole matter was properly settled four months ago, when I bought in the property at a receiver's sale and paid over $100,000 for it and took the receipts for it."

James B. Everman, for many years connected with the Walter S. Dickey Clay Company, of Kansas City, recently died at his home here. Mr. Everman was thirty-nine years old and is survived by his wife.

The Hydraulic Press Brick Company is furnishing brick for many of the new buildings now under way in Kansas City. The Firestone building and the Duff and Repp Furniture Company's new building have required thousands of the famous Hy-tex brick, as well as the Bales Baptist Church. The St. Joseph's Hospital at Kansas City, one of the finest buildings that has been under construction in Kansas City for some time. The building is in the shape of a letter X, so designed as to give each room plenty of light and air and an outside opening. The brick is being furnished by the Hydraulic Press Brick Company.

The Western Paving Brick Manufacturers' Association reports that it has been receiving a large number of contracts for brick paving throughout the Southwest. One of its members has been shipping many million paving brick to Lake Charles, La.

Under the direction of J. C. Wright, boys of the summer industrial school will build the first of the three units of a brick shop building for the Lathrop School. The building is to be one story high and the first unit is to be thirty-four feet long and eighty-four feet wide. Twenty or thirty boys will be employed in the work and the construction will begin the first Monday after the close of school. One-half work in the morning and the other half work in the afternoon. The boys are already skilled electricians, plumbers, woodworkers, painters and finishers. When it was proposed to build the new addition to the school and have the pupils to do the work, the proposition was put up to them and the boys, in forming the plans, unanimously adopted brick for the construction of the building. Mr. Wright, their instructor, recently said: "Instead of making a lot of useless things, the boys will do something that is useful to the city and of value to them as well."

K. A. W.

NEW YORK AND VICINITY.

A CONSIDERABLE FLUCTUATION has characterized the common brick market the past month and the general tendencies of the market have been toward a higher basis. As high as $8.50 has been paid for Hudson river commons, and $8.00 to $8.25 continues as the price named on most that come to market now.

Laborers at the Brockway, Hammond, Aldridge, Roseton and Dugan yards struck, despite the fact that concessions were given them, but they afterward returned to work. Notwithstanding this, a genuine shortage of labor was reported and manufacturers have difficulty in getting the number of men they want. Higher wages are paid by all the Hudson river yards this season, caused by the demand for labor in industries depleted or influenced in one way or another by the war.

Demand for brick is more liberal, relatively, in the suburbs than it is in New York, but a good demand is reported in both localities. A great deal of building is planned for all the suburban communities and in many instances brick is specified. If brick is not used, fire proofing is, so burned clay enters into the erection of almost every house that goes up.

New York is still at work on its new building code. At present an effort is being made to eliminate, so far as possible, duplicate inspections and put the erection of buildings all under one bureau, saving builders from the annoyance and expense of duplicate inspections, each conducted by a different department, and each calling for the payment of a fee. Many builders complain of this troublesome feature of attempting to do business in New York. But with these difficulties removed, the principal retarding influence in New York City will disappear. The building code has been in process of organization for years. Really, it has been a growth and has developed as it was wanted. Before very long the code will be ready for enforcement.

Shipment of brick by water has been made easier by the settlement of the misunderstanding with the tug boat engineers. The dispute was adjusted and they returned to work. Immediately it was possible to resume shipments about New York harbor and where the delivery of brick was dependent upon these people, movement began. Brick suffered less than some commodities, for the tug boat employes that towed the brick down the river were not involved and the tugs placed the barges where they were wanted without the delay incident to a tie-up of traffic.

The National Fireproofing Company has the contract to furnish the fire proofing and terra cotta for the Vacuum Oil Company's new buildings at Bayonne, N. J., which are to cost $2,000,000.

Trade in brick in New Jersey continues as active as it was last month, though prices fluctuate somewhat and perhaps, as a whole, are not as stiff as they were last month. From $8.00 to $8.50 and sometimes $8.75 is obtained for Raritan brick now and buyers have some difficulty in obtaining what they want. All the Raritan plants are in operation and in a general way sales are quite as active as they have been all along. Few seasons ever opened better in New Jersey.

Opening the Delaware and Raritan canal to traffic between Perth Amboy and Philadelphia has resulted in affording brickmakers in the Raritan district a low-priced means of shipping to Philadelphia by water if they desire.

A. L. B.

FAVORS PREMIUM PAYMENT FOR WORKMEN.

SECRETARY OF WAR Newton D. Baker is on record as favoring the bonus idea or the premium payment of paying labor and in opposition to efforts of labor unions to have a law passed prohibiting the use of time clocks and the bonus systems for government workmen. Mr. Baker sets forth that the timing and bonus system has been in practice at the Watertown, Mass., arsenal and they are finding it very satisfactory, indeed. He says that it represents an achievement of which both the legislative and the executive branches of the government can be justly proud. Also he points out that the reproach is made that the government cannot conduct an economical and efficient industrial enterprise, but he says no such charge can be brought against the Watertown Arsenal, where the timing of work and the studying of the best methods, together with a premium system of payment, has resulted in increasing the efficiency of the workmen, also increasing their pay and in no case has it brought any complaint of overwork or hard driving.

Organized labor has not only been shown in opposition to bonus and premium ideas by an investigation of this subject by the National Civic Federation and in this way offered a serious check or handicap to the successful promotion of such ideas, but it is now opposing such plans by urging legislation on the part of congress to prohibit the use of time clocks and records and bonus and premium systems in government work.

Speaking on this point, Secretary Baker says organized labor is opposed to this system because they charge that it is a speeding-up system, one calculated to drive the workmen harder and make them produce more for the employer. He says there is no evidence of truth in this charge at the Watertown Arsenal, where this system is in practice, but there is a good deal of evidence the other way. There is no complaint of overwork at the arsenal, no workman has been discharged because of the failure to meet the requirements of the system. While, on the other hand, it has resulted in greater efficiency and better pay.

Incidentally, too, in discussing this subject, Mr. Baker gives an interesting opinion on the relation of fatigue and efficiency derived from a study of conditions in the older countries. He says there is no doubt but what the nervous and physical system of a workman is imperiled and his strength decreased if he is urged or induced to work beyond a certain maximum rate or gait. On the other hand, he argues that it is always bad for a man not to do his best, for it begets sluggishness, both mentally and physically, and eventually produces deterioration. He argues, therefore, that we should follow a happy medium ground and encourage the right effort and best methods, not only for the sake of the immediate increase in production, but also for the good that comes through making men better, stronger and more active.

MOTOR TRUCKS IN THE BRICKYARD.

THERE DOES NOT SEEM to be any longer a question of whether we should use motor trucks on the brickyard. The questions are what kind, for what purpose and to what extent they may be used advantageously. Everywhere all around us people are using motor trucks more and more extensively and it is invariably the case that when motor trucks are once installed there is no going back again, but a steady going forward and an employing of more motor trucks.

At the last annual N. B. M. A. convention the discussion on the motor truck subject demonstrated that there are two phases of it. One is the use of motor trucks for yard service purely, that is, in place of wheelbarrows for handling brick and material in limited territory around the plant. The other is the use of trucks for general delivery of brick and other building material to jobs.

The question of trucks for purely yard use is one that depends materially on local conditions, but it is easily a factor in the brickmaking business worthy of careful study by every manufacturer, even though it has not yet received as much attention as the other phase of the matter, that of using motor trucks for delivering brick to consumers.

Not only is the truck replacing horses and mules for delivery to city jobs and doing the work at less cost, but with the building of good roads throughout the country, the territory of the motor truck is being materially enlarged and so rapidly extended that it is easy to see where and how the truck will soon be making lots of deliveries that heretofore have called for using railway shipments. Indeed, this is already the case in many instances, trucks have been used in making deliveries up to ten or twenty miles or more where roads are good and have made these deliveries at a saving in expense as compared to loading and unloading and shipping by freight.

Thus, between the good roads and the motor trucks, the brickyard is being put in much closer touch with the surrounding territory and in a position to give better service at less cost. It is now practical for the farmer to get brick out in the country and build his farm home or barn of brick at a very little additional cost, as compared to lumber, whereas, before the coming of good roads and motor trucks, the problem of hauling to country points was a somewhat burdensome handicap to the progress of brick building.

The truck branch of the automobile business has received more attention at the hands of the manufacturer the past year or two than the automobile end of it and there has not only been much development, but in the concentration of attention upon this branch of business it is easily evident that there will be much additional growth and that it will overshadow the passenger machine business itself. Trucks for hauling have come forward in as great a number and variety as they did in passenger machines a few years back and they have the benefit of serving a good industrial and commercial purpose and not merely for pleasure vehicles and personal satisfaction. The motor truck is easily one of the most interesting phases of the business development the past few years and it is evidently to be quite a factor in the work of expanding the brick business and the use of brick in building operations.

NINETEENTH ANNUAL MEETING AMERICAN SOCIETY FOR TESTING MATERIALS.

Atlantic City, June 27 to 30.

The members of the American Society for Testing Materials will gather at the Hotel Traymore, Atlantic City, June 27 for the annual meeting of that society. As usual, an elaborate program has been prepared. The committees on brick, tile, cement, concrete and other ceramic materials will report Thursday the 29th. Wednesday afternoon will be devoted to recreation, and there will be a smoker Thursday evening to which all delegates and visitors will be welcome.

Committee 3-C, of which Professor Edward Orton, of Columbus, Ohio, is chairman, and A. V. Bleininger, of Pittsburgh, is secretary, will meet Wednesday for conference and at subsequent times as may be found necessary during the week.

Members of the N. B. M. A. who can do so are urgently requested to be present and participate in these meetings; members of the executive committee are particularly urged to attend as the time and place for the next national convention will be considered at that time. It goes without saying that it is wise to request reservations at Hotel Traymore in advance.

The Sample-Williams Clay & Color Company, Jackson Ala., are in the market for a good second-hand stiff mud brick machine which does not require more than 30 horsepower to operate.

THE PASSING OF HARLEY FATE.

A Conspicuous Figure in the Clayworking Industry Answers the Final Call After a Brief Illness.

AGAIN WE ARE called to chronicle the death of a man prominent in the clayworking industry of this continent. When the grim reaper carried Harley H. Fate into the great beyond May 27, at the Huron Road Hospital, Cleveland, Ohio, our craft lost a widely known personality.

"Harley," as every one knew him, was known the width and breadth of this large country of ours, not only for his genial disposition, but for his keen business insight and the splendid products turned out by his factory.

He died at the age of 45 from a minor operation. He was reported in splendid condition the day before the end came and those in closest touch with the situation expected his early return to his life long work.

He was just in the prime of his life and was enjoying the full benefits resulting from his years of untiring efforts. We can not account for the actions of the Great Power over us, but we know from all the teachings and our infinite faith that all is for the best. In extending our sympathies to his family, associates and friends, we wish to give out this thought in the words of the famous Hoosier poet:

"I cannot say and I will not say
That he is dead—he's just away.
With a cheery smile and a wave of the hand
He has wandered away to an unknown land."

The memory of Harley will be kept alive wherever the products of his factory are in use. He was of great service to the craft and the world in general, for by constant study in keeping his products up-to-date and of the required efficiency he has furnished hundreds of plants equipment which produces millions of tons of clay goods of inestimable value in the housing of the people of the country. Those who knew him in a business way will remember him for his good business sense while those who were more intimate with him will cherish the thoughts of his jovial manner, his stories and anecdotes, the friendly clasp of his hand, the good natured smile and the earnest felicitations and assistance in case of need.

The great love his family, fellow townsmen and intimate acquaintances bore for him was demonstrated at his funeral, which was held in the Fate residence Decoration day. For several hours there was a constant line of people passing to and from the house and the front lawn was crowded with friends who came to pay their last respects. Hundreds of beautiful floral offerings covered the casket and banked the corners of the room.

The services fitted the occasion, the Rev. A. C. Miller, of the St. Mathews Lutheran Church, Mansfield, Ohio, and the Rev. Mr. Smith, of the Lutheran Church, Plymouth, Ohio, officiating. A masonic ceremony was also performed. The Knights of the Mansfield Commandery attended in a body in full costume. Mr. Davidson, a member of the office force of the J. D. Fate Company, sang beautifully Tennyson's "Crossing the Bar." The Knight Templars band played suitable music as they lead the long procession to the cemetery.

Harley H. Fate was the son of John D. and Mary E. Fate. He was born at Crestline, Ohio, February 19, 1873. When nine years of age his parents moved to Plymouth, Ohio, where his father began the manufacture of clayworking machinery. Even in his boyhood days he spent many hours about the factory and was so familiar with the work that upon the death of his father in 1902 he became president of the company. He and his brother, Harry S. Fate, carried on the business which has made great strides in the last dozen years. Harley with his brother established a motor truck works several years ago which has been merged with the J. D. Fate Company and it is there they make their gasoline locomotives.

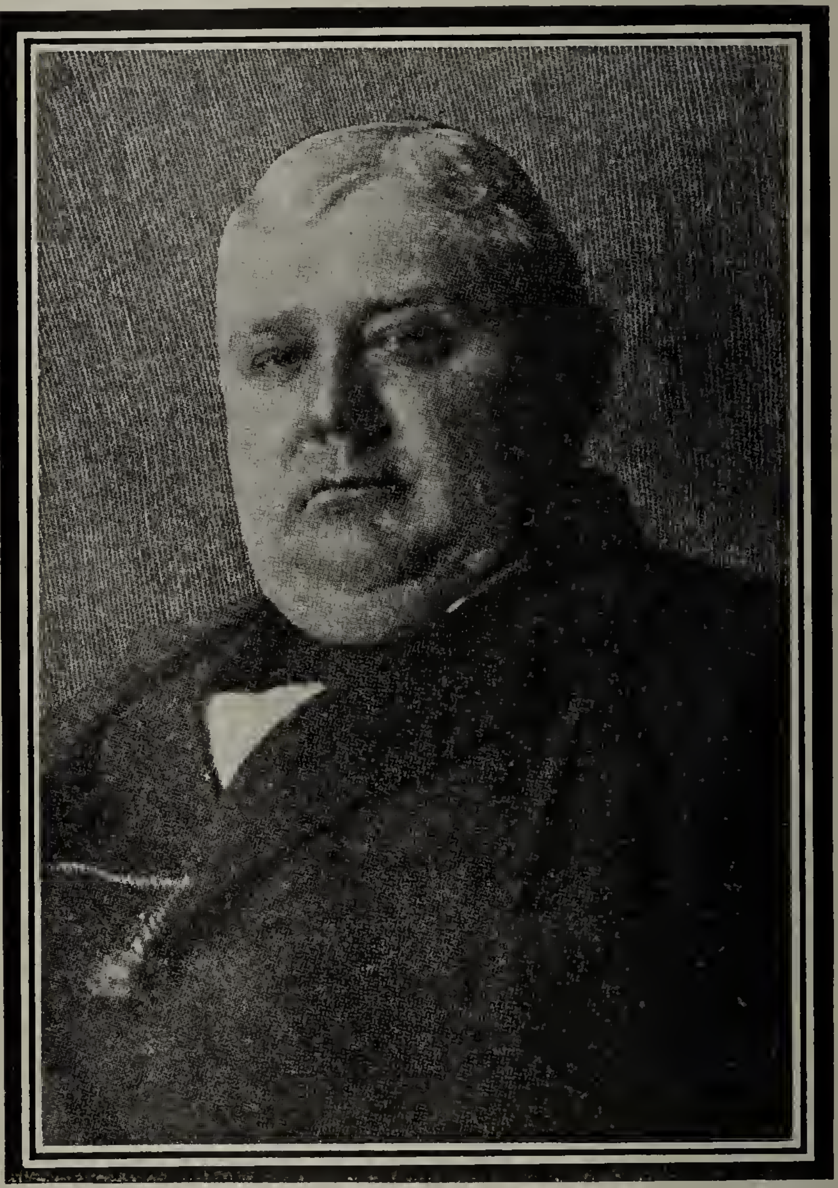
Harley was married to Anna B. Lawton, of Three Rivers, Mich., in 1903 and there came of this union two daughters. His widow and the daughters, Mary Josephine and Gertrude Emaline, ten and six years old respectively, survive him.

The business of the J. D. Fate Company will be carried on by Harry S. Fate, formerly vice-president; George B. Drennan, secretary-treasurer; H. Ray Sykes, director, and H. J. Votaw, all of whom have assisted materially in the upbuilding of the business.

AN APPRECIATION OF HARLEY H. FATE.

When death, grim, relentless, inevitable, as it always is, laid its merciless hand on Harley Fate it removed from among the living a prominent character in his chosen field of life.

Jovial, good-natured, good-hearted, always smiling and ready for a "good story," ever looking on the bright side, Harley was the center of a group of admiring friends wherever he went.



The Late H. H. Fate.

Harley not only was fond of listening to a good story, but had a fund of anecdotes and enjoyed relating them. Characteristic of the man, wherever there was a poignant climax in which someone must suffer, or where the shaft of ridicule or satire must fall on those among his hearers "to carry the point over," Harley invariably made himself the "goat," to the amusement of everyone and, quite often, to his own discomfiture.

This good nature of Harley made him a popular figure at all the conventions of clayworkers, few of which he missed. Spot a group of laughing, joyous delegates in a hotel lobby, it always was safe to wager that in the center was Harley Fate, and this ever-pleasant disposition was sure to hold this little group together hours after others had become weary and disbanded.

In Plymouth, Ohio, the place of his birth and his home until the final summons came, Harley was held in even higher esteem by his fellowmen, for it was there he was best known.

He was "Harley" to both child and grownup, and even the dignity of his position as chief executive of one of the largest manufacturing establishments of its kind in the Nation, did not chill this familiarity.

But with all his jollity and his love of pleasure and fun, Harley was a serious business man, a successful business man. Perhaps it was his keen insight into human nature, perhaps the halo of good-heartedness and honesty, or both, that made men trust and respect his business word.

And neither did his good nature prevent him from being dominant in his business relations with his fellow men, yet no severity, nor unjustness, marked his actions, and all he did was tempered with the spirit of "Do unto others as you would have them do unto you."

To those of us who knew him best, socially and in a business way, Harley was all that was to be desired, and it is safe to assume that when he comes before the final judge of all to be measured up he will not be found wanting.

IVERSON C. WELLS.

Chicago, June 12, 1916.

OBITUARY.

Bernard Suer, a well-known brick manufacturer of Cincinnati, Ohio, died at his home in that city May 29. Mr. Suer was sixty years old and was at the head of the firm of Bernard Suer & Sons, manufacturers of brick and building materials. He is survived by five sons and five daughters.

W. M. Baker, superintendent of the Henry Brick & Tile Company at Lancaster, Pa., died suddenly at his home last month. He had been suffering with kidney trouble for some time, but was not thought to be in a serious condition. His wife and one daughter survive.

Henry Dreischmeyer, Sr., of San Jose, Cal., the pioneer brick manufacturer of Santa Clara county, died suddenly, May 26. Mr. Dreischmeyer moved to San Jose from Chicago fifty-three years ago and established the first brick plant in that city, and retired from the brick business only a few years ago. He leaves a wife and four sons.

George W. Washburn, a brick manufacturer of Saugerties, N. Y., and president of the Washburn Brothers Company, died June 1, at his home in Saugerties, aged seventy-four years. He was born at Haverstraw, and for many years, with his brothers, was engaged in brickmaking along the Hudson river. He was a director of the First National Bank of Saugerties.

Edward Nicholson, for many years a well-known fire brick manufacturer of Steubenville and eastern Ohio, died in Los Angeles, Cal., June 7, after an illness extending over several years. While still a young man, he started in the fire brick business with his father and continued in that business until compelled to retire on account of ill health, when he moved to California.

M. F. Ellis, a contractor and brick manufacturer of Atchison, Kan., died at his home in that city June 1, after a lingering illness. Mr. Ellis is said to have really been the founder of the vitrified brick industry in Atchison. He discovered that some of the hills around the city were rich in vitrified brick clay, and made his first brick by burning them in a stove. His first large order of brick was for paving South Fifth street. Later he organized a company with Tom Beattie and Charles Benning, but afterwards Mr. Ellis sold his interest in the brick company, and returned to his contracting. Later he established and operated the brick plant for the army and the department of justice at Leavenworth, and in 1890 organized a brick company in Kansas City.

George Francis, a pioneer brick manufacturer of southeastern Kansas, died suddenly of heart disease at his home in Coffeyville recently. He was vice president of the Coffeyville Vitrified Brick and Tile Company. Mr. Francis was credited with having been the man in this section who discovered shale for brick manufacture. He was prominent in church circles.

John Price, who for forty years was the proprietor of the Price Brick Co., died at his home in Toronto, Ontario, Canada, May 27. Mr. Price contracted a slight cold, which developed into pneumonia and to which he succumbed after four days. He was seventy-one years of age and had come from Bridgewater, Somershire, England when just a young man. His widow, two sons, George P. and Charles H., and two daughters, all of Toronto, survive.

NOTICE.

To the Illinois Clay Manufacturers.

The outline for "The Uniform Cost Accounting System," adopted by the Illinois Clay Manufacturers' Association, is now ready for distribution. Every clay manufacturer in Illinois who does not receive a copy of this outline may obtain one by writing to the Ceramic Engineering Department of the University of Illinois, Urbana, Ill.

ELZEY'S BRICK MANTEL DESIGNS.

With a view of aiding home builders to build attractive brick mantels, E. P. Elzey, Parkersburg, W. Va., has issued a book of mantel designs. There are nearly a half hundred illustrations in the book of mantels, each and any of which can be constructed of building brick. Several patterns of brick hearths are also shown, and there is a brief treatise on chimney construction, all of which is of interest to the builders of brick homes. Single copies of the book will be mailed to any address by Mr. Elzey on receipt of 25 cents. Those wanting copies for distribution to their local trade can have them in lots of 100 or more at 15 cents each.

THE FELDSPAR INDUSTRY.

The mining and marketing of feldspar constitutes quite an important small industry in this country and holds interest for clayworkers because more feldspar is used as a body and glaze in pottery and tile perhaps than in any other work. Feldspar is also used in making enameled ware and in the manufacture of scouring soaps and in making some of the prepared roofing material and chicken grits. Some of the feldspars are potash bearing, and efforts are being made to use them as fertilizers. These are not successful wherever feldspar is used as it is; but experiments are being tried in treating feldspar to make the potash more soluble and there is some hope that this may result in creating a market in the fertilizer line for some of our feldspar product. The production of feldspar in 1915 was 113,769 short tons, valued at $629,356. This was somewhat below the figure for 1914, but it is expected that during the present year it will regain the lost ground, as we have more activity in the clayworking industry. The price paid for feldspar in 1915 averaged about $3.50 per ton for the crude material of pottery grade and about $8.33 per ton for ground material for pottery. Higher grades, used for other purposes, ranged up from $11.50 to $12.00 per short ton. Maine ranked first in the quantity and value of output, followed by North Carolina, New York, Pennsylvania, Connecticut, Maryland, California, New Hampshire, Virginia, in the order named.

HOW MUCH FOR BRICK BOOSTING?

He is Wise Who Profits by the Experience of Others. Will Brick Manufacturers Do So?

WE are all pretty well agreed that the brick business needs a campaign of systematic exploitation, needs advertising, boosting that is consistent with the magnitude of the industry and quality of the product—which is the best all-around building material to be had. The only questions involved are those of ways and means—how much in the way of a general fund should be raised and how it should be expended.

How much should be raised and expended? is the Big question and the first question.

In fact, it is a Big question with a capital B.

Also, it is the first question that we should have some definite decision upon.

To this end there is appended herewith some facts and figures to pave the way to some sort of a solid and reasonable basis of understanding about the quantity that should be raised and how each should share in it.

Perhaps the best example of exploitation in comparative lines that enter into competition with brick is furnished by the Southern Pine Association, and the figures and work of this association may well be studied with a view to determining how much in comparison the brick people should use for exploitation.

The Southern Pine Association, which represents the yellow pine industry, has raised a fund of between $200,000 and $300,000 annually. The raising of this fund was primarily started on a basis of assessment of 25 cents per thousand feet of lumber sold. Some changes have been made since. If enough mill men have subscribed to the fund they have been able to reduce the per thousand feet assessment. However, the original basis was 25 cents per thousand, and this has raised a fund of from $200,000 to $300,000 per year.

In a way the yellow pine division of the lumber industry compares with the building brick division of the clayworking industry—that is, in its relation to the industry as a whole.

In seeking figures for comparison between the quantity and value of yellow pine lumber produced and sold annually and the quantity and value of the annual production of building brick we find that:

The yellow pine production varies considerably from year to year, just as the brick production. It ranges from 12,000,000,000 to 16,000,000,000 feet.

The average per thousand value of yellow pine lumber at the mill is approximately $15.

Taking 13,500,000,000 feet as an average production and $15 per thousand as the average value of wood, we have a total annual value for yellow pine products of $202,500,000.

Now for comparison with brick.

There was produced last year, which was about the lowest year in ten years, common brick to the value of $43,769,524 and front brick to the value of $9,289,623.

Therefore, leaving aside the enameled brick, terra cotta and other special burned clay building material, we have a total brick value of $53,059,147.

This is substantially, to give it in round figures, one-fourth the value of the total yellow pine production, which includes the finer finish as well as the common lumber.

Hence, figuring on a comparative basis with yellow pine, it would call for an annual exploitation fund for the building brick industry ranging from $50,000 to $75,000.

This is approximately one-fourth of the annual amount signed up for yellow pine, which is $200,000 to $300,000.

Now, if the yellow pine people assess 25 cents on a thousand feet, valued at $15, the brick industry, to compare with it, should assess about 12½ cents per thousand on brick, for the average value of common brick and front brick would be, in round numbers, approximately $7.50.

Speculating on that possibility, a little figuring has been done on the basis of assessing a fund of 12½ cents per thousand on brick, and using 2½ cents of it for the central bureau work and the other 10 cents for local exploitation.

Taking the total production of common and front brick, we have 7,146,571,000 common brick and 801,395,000 front brick for last year, which, as stated, was a low record.

To multiply this total by 2½ cents per thousand would give us $199,924.15.

Since we have just been talking about raising a fund of only $50,000 to $75,000 with 12½ cents per thousand, it looks startling and suggests that there is something the matter with the figures somewhere, to see 2½ cents figure out this way.

In checking over the figures and making a study of the lumber output, the apparent discrepancy is easily evident.

Only a small per cent. of the lumber producers contribute to this fund.

Here are some figures to show what would happen if everybody paid at the rates given above:

If all the yellow pine people paid 25 cents per thousand feet, that fund of theirs, instead of being $200,000 to $300,000, would be from $2,000,000 to $3,000,000. In other words, when we multiply 13,500,000,000 feet of lumber by 25 cents per thousand, we get the grand total of $2,025,000.

Also, if we multiply the total production of common and front brick by 12½ cents per thousand, we have the startling total of $954,835.92, almost an even million dollars.

The answer is plain. Only from 10 to 12 per cent. of the people contribute to this fund and carry the advertising burden for the balance.

In checking over the yellow pine figures it is found that there are more than 2,000 mills producing, yet a count of the members subscribing to the advertising fund shows only 177 mills.

These mills are perhaps large factors and amount to more than twice that number of smaller mills, but the fact remains, after the figures are analyzed, that only approximately 10 per cent. of the yellow pine production is depended upon for this advertising fund. That is why the assessment per thousand is 25 cents instead of about 2½ cents, which it would be if every thousand feet of lumber paid.

As compared to 2,000 mills making yellow pine lumber, there are approximately 4,000 concerns making building brick. The question is, can we figure on 400 out of this 4,000 participating in fund-raising for exploitation?

To get back a moment to the basis of calculations, or rather the basis of exploitation, as compared to the total annual value of the product, we find that the yellow pine people are spending a little more than a thousand dollars for every million dollars of product.

On this basis the building brick industry should spend a little above $50,000 a year.

It should be borne in mind that this yellow pine fund is not the only advertising expenditures. It is the amount expended in support of the association and for general advertising by the association, and is entirely apart from the expenditure of individual firms and retail dealers.

Practically every important yellow pine manufacturer advertises extensively in the lumber papers to reach the retail yard trade and other consumers of the product. Then, again, retail lumber dealers do considerable advertising.

In other words, the yellow pine fund should really compare with the central bureau fund for brick boosting, in addition to the amount spent locally by each individual manufacturer.

It may be well to inquire for a moment into just what is being accomplished by this yellow pine exploitation.

The one big important outstanding fact today is that yellow pine has increased in value an average of about $5 per thousand feet since that campaign started last summer.

The Southern Pine Association does not claim to have produced this increase in value, nor the improved volume of business that goes along with it, but the value is there just the same, and they are doing good work, which is undoubtedly a contributory factor in improving the yellow pine situation.

Think what it would mean if we could increase the price of brick $2.50 per thousand inside of a year, and increase the demand proportionately!

It would mean the greatest era of prosperity on record in the brick business, and it would make an advertising fund to bring this, the best investment the brick trade ever made.

That proper exploitation will do good and help increase the volume of brick demand, making room for the obtaining of better values, there is no question.

CLAY PIPE AND CAST IRON.

Quite an interesting study is furnished in the relative quantities produced and the chances for trade shifting in clay pipes, as compared to cast iron, because in some instances they come into direct competition.

The clay pipe in mind here is of the sewer class type, while the cast pipe is that known as soil or plumbers' pipe. The annual production of clay sewer pipe runs usually between $14,000,000 and $15,000,000, while the annual production of soil or plumbers' pipe in 1914 was $6,173,708.

The cast iron pipe product of the country amounts to something more than a million tons a year, valued at more than $25,000,000. The biggest item in this is gas and water pipe, which accounts for nearly three-fourths of the total, while the main part of the other fourth is made up of cast pipe and fittings for plumbers' use, known commonly as soil pipes.

Comparing the entire sewer pipe production with the cast iron pipe, we find that the clay pipe is more than double in value, which means a much larger showing in quantity, because the clay pipe is less expensive than the cast iron pipe.

Large quantities of clay pipe are used in larger sewers and drains where there is no question of cast pipe enters, but in the plumbing and drainage of homes there is a meeting place where one enters in competition with the other. The cast pipe people, by encouraging special legislation requiring the use of cast pipe for soil pipe or underground drainage wherever a drain is in a basement or under a building, have crowded the clay sewer pipe out of quite a lot of use that it is really better for in some respects than is the cast pipe.

Not only is there room by proper exploitation and education to increase the quantity of clay pipe used there for drainage purposes, but there seems to be a chance to spread out a little and develop a much more extended use of sewer or terra cotta pipe for down-spouts and for waste drainage, for house roofs in lieu of the tin and galvanized iron that is so commonly used today. The thin metal pipes are not only flimsy to start with, but they soon decay. From three to five years' time sees the pitting through and ruining of the average thin metal down-spout. It would cost a little more to do this with clay piping, but once done it would last forever and there, as in the using of brick for home walls, it hsould prove cheaper in the long run.

Some day we will realize that the ideal drainage proposition for a house roof is to use clay tile roofing, tile guttering and clay piping for the down-spouts, which will make it all in harmony, structurally, with the brick building and will insure a permanency that is not obtainable with any other material.

This is turning aside a little from the proposition of competition between the cast pipe and the clay pipe, but it all goes together. In the building of homes there is room for a much wider extension in the use of clay products, including sewer pipe and some special clay piping for down-spouts and for guttering. A little research work along this line, followed by a campaign of educational exploitation, should make more business for this line of clayworking and result in a better and more satisfactory system of house drainage.

BURNED CLAY IN OLD TUNIS.

DECORATIVE TILES are so old that neither the records nor the memory of man runneth back to the time when they were first used for that purpose. Neither is the inventor known. They are found in most of the old cities of the Old World, where they have been used for centuries for decoration, and are today, in most instances, as handsome and artistic as they were the day they were placed in position.

A returning traveler who has passed many weeks off the beaten tracks and is intimately familiar with not a few cities, generally unknown to Americans, cannot restrain his enthusiasm when describing the decorative tile work in the old portion of the city of Tunis. That is the Arab section and many of the interiors of the dwellings and mosques, not a few centuries old, are richly decorated with tiles which cannot be surpassed for beauty. These tiles are everywhere. Even the humble dwellings are in many instances decorated with tiles which would be worth their weight in gold in Europe or America. But they are inviolate. No one can touch them. The owners of the buildings would consider it sacrilege to remove even one, much less to take out any considerable number.

What strikes the visitor so unusually in tile work is the singular beauty of coloring. The gentleman who describes them is something of an artist, and his impressions were that such blending of coloring is in every sense remarkable, and well worth the study of clayworkers today. The old Moorish designs are prominent in many buildings, superseded in some instances by the late Spanish and again preceded by the earlier Arabic. Now the French, where they are rebuilding the city, or are extending the new portion, are attempting to imitate some of these old tiles. So far their work has not been as successful as artists might wish, but they are likely to improve as they become better acquainted with the requirements and the necessities of manipulation. With such splendid examples this gentleman believes they will eventually achieve something which will be a close approach to what has been done in the centuries past. The discovery of these beautiful tiles has aroused a fresh interest among artists in this class of work.—"Scientific American."

These columns are open to all. The full name and address is required, but will not be published except when permission is given. Those desiring to communicate privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

Brick Machinery Wanted for Australia.

Editor The Clay-Worker:

We have received a cablegram from clients in Australia asking us to mail them at once specifications, illustrations and prices on all machinery and equipment necessary for a complete plant for the manufacture of magnesite brick, the plant to have an annual capacity of a quarter million ordinary brick. We will be pleased to receive catalogues and quotations at our New York office, 50 Broad street.

SNYDER & BRYAN, Inc.

An Interesting Device for Clayworkers.

Editor The Clay-Worker:

Although not actually engaged in the clay industry at the present time, it is a subject that I am interested in very much, an interest such as musicians and artists are interested in their hobbies. I never miss an opportunity of visiting works of any size or kind engaged in the manufacturing of clay into useful articles.

It is not always from the largest plants that I gain the most information. Very often from the smallest and apparently the most crude, I see things worthy of mention.

In this article I will describe a device I know will be appreciated by those using a tunnel dryer and dryer cars.

The device is entirely automatic and is a 100 per cent a month investment to anyone using dryer cars. It is not patented as far as I can learn. I saw it at a small brick works which was closed down, and as there were no persons about, I cannot give the name of the owners. It was entirely handmade and still worked admirably when I saw it.

The cut shows the various parts and are not to scale, as the dimensions will have to be varied to suit different types of cars.

The information will enable any blacksmith to make the device. The pictures give an idea of the device that I told a man about seeing and who immediately had one made and who told me it was the best thing that he had on his plant.

There is a tendency of men to neglect to lock the cars on the transfer when the lock is manual operated, but with this device negligence does not count.

S. P. BAIRD.

Practical Clay Testing.

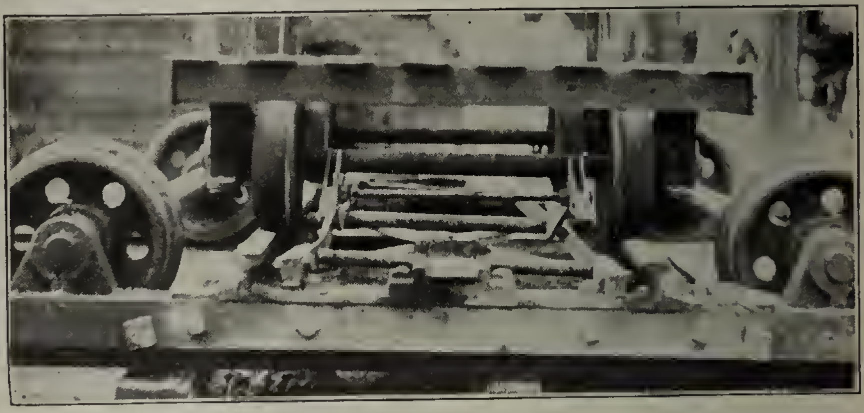
Editor The Clay-Worker:

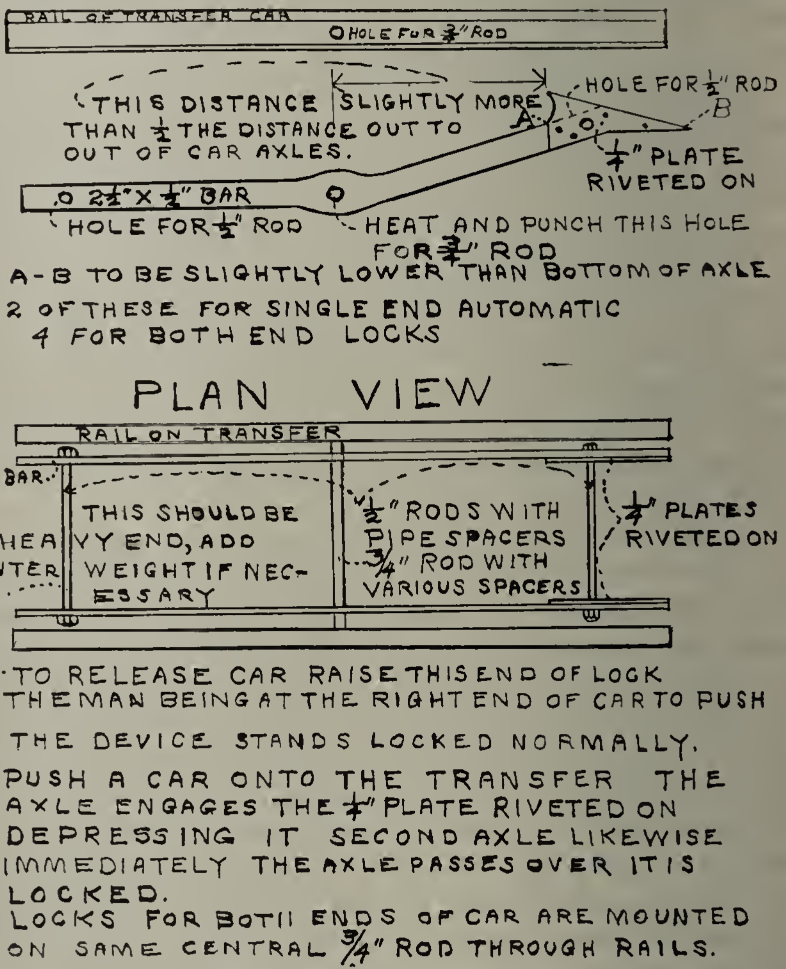
I have noticed in The Clay-Worker of May, on page 560, "Analyzing Clay and Physical Testing." This is certainly very interesting, therefore I have read it very carefully and was wondering how many clayworkers will derive benefit by reading it.

We all realize that we have to learn and, therefore, we appreciate it very much when we have an opportunity to read a scientific paper which helps us in our trouble, and we ought to be very thankful to those technical men who spend their time to write us things from which we can learn, and that help us in our daily life struggle in the clay industry.

But some times we really read something which arouses temptation in us to put into practice our readings, and then we start in without knowing the cost of such undertaking which is apt to require a big sum of money, and the end for which we are striving will work out with many disappointments.

The same is true with this article, and will occur when a clayworker will undertake to make his own clay analysis without taking any courses in chemistry. If he really had saved a few hundred dollars he would do better to go to Urbana or any other university and take a short course so that he can see how those things are conducted, and how the apparatus and chemicals are handled, and from this he will get more benefit than if he buys all that expensive chemical equipment described in the Clay-Worker for May, and also buys the costly chemicals, especially nowadays when the platinum ware and chemicals are many times higher than before the war.




RAIL OF TRANSFER CAR
HOLE FOR 3/4" ROD
THIS DISTANCE SLIGHTLY MORE THAN 1/2 THE DISTANCE OUT TO OUT OF CAR AXLES.
HOLE FOR 1/2" ROD
A
B
1/4" PLATE RIVETED ON
2 1/2" X 1/2" BAR
HOLE FOR 1/2" ROD
HEAT AND PUNCH THIS HOLE FOR 3/4" ROD
PLAN VIEW
RAIL ON TRANSFER
2 1/2 x 1/2 BAR
THE HEAVY END, ADD COUNTER
THIS SHOULD BE WEIGHT IF NECESSARY
1/2" RODS WITH PIPE SPACERS
3/4" ROD WITH VARIOUS SPACERS
1/4" PLATES RIVETED ON
TO RELEASE CAR RAISE THIS END OF LOCK

A-B TO BE SLIGHTLY LOWER THAN BOTTOM OF AXLE

2 OF THESE FOR SINGLE END AUTOMATIC
4 FOR BOTH END LOCKS

TO RELEASE CAR RAISE THIS END OF LOCK THE MAN BEING AT THE RIGHT END OF CAR TO PUSH

THE DEVICE STANDS LOCKED NORMALLY.

PUSH A CAR ONTO THE TRANSFER THE AXLE ENGAGES THE 1/4" PLATE RIVETED ON DEPRESSING IT SECOND AXLE LIKEWISE IMMEDIATELY THE AXLE PASSES OVER IT IS LOCKED.
LOCKS FOR BOTH ENDS OF CAR ARE MOUNTED ON SAME CENTRAL 3/4" ROD THROUGH RAILS.

Device for Locking Cars on Transfer Track.

The only benefit that the reader may get out of this article is the acquaintance with some of the apparatus used in making a clay analysis but how to handle and how to conduct an analysis is impossible to be learned from it.

I sincerely can recommend only, not to experiment with chemicals in this day, as it is very costly and in the end you will experience many disappointments, will get disgusted with your mistakes, and your success will be very poor, indeed. It is better, if you are troubled with your clay or shale, to send it to some university where you get a reliable service for your money, one on which you can depend that it is correct.

It is a very hard task for anyone to explain to a layman, who has not the least experience, how to conduct a chemical analysis, since such work requires trained hands and special knowledge in performing the analysis and calculations.

I am including an analysis made by the writer with the report of calculations as the analysis is proceeding, step by step. By this the reader who has no experience in chemistry can see where he gets lost without having a training in this science.

Clay Analysis of North Shaft, Lincoln, Illinois.

One gram of specimen was taken for analysis.
Pt. cr. w. = 21.073 gms.
Pt. cr. w. + R. of SiO_2=21.678—21.073=.605.
Pt. cr. w. + R. of SiO_2 after HF. treatment=21.080.
21.678—21.080=.598+.002=.600×100=60.00% SiO_2
Pt. cr. w.+R. of $Al_2O_3+Fe_2O_3$=21.302
Pt. cr. w.+R. of $Al_2O_3+Fe_2O_3$=21.300

.002

After HF. treatment 21.300—21.073=.227×100=22.70% A_1O_3 $+Fe_2O_3$. 1 c.c. of $KMnO_4$ used represents 0.0011gms. of Fe_2O_3. The reduction was completed after 10 gms. of Zn. had been dissolved in the solution and the solution required 39.6 c.c. of $KMnO_4$. In the blank experiments 10 gm. of Zn. dissolved in 15 c.c. dil: H_2SO_4 required 3.5 c.c. of $KMnO_4$ solution. Hence:

39.6—3.5=36.1×.0011=.03971×100=3.97% Fe_2O_3
22.70—3.97=18.73%Al_2O_3
Standard sol: of TiO_2 50 c.c.
Pt. cr.+ R. of TiO_2=21.130
Pt. cr. w...........=21.070

.060 TiO_2

Containing 1.200 gm. TiO_2 in one L. titanium sulphate=46 c.c. kind. cal. was used to determine the TiO_2 in the clay.

46×.00012=.00552×5=.02760×100=2.76% TiO_2
18.73 Al O—2.76 TiO_2=15.97%Al_2O_3
Pt. cr. w. +R. of CaO=21.086
Pt. cr. w............=21.073

.013×100=1.30%CaO

Por. cr. w.+R. of $Mg_2P_2O_7$=14.307
Por. c. w...............=14.236

.071 $Mg_2P_2O_7$

.071×.3627=.0257517×100=2.58% MgO
Por. cr. w.+R. of $BaSO_4$=14.254
Por. cr. w...............=14.234

.020

.020×.34352=.00687040×100=.69% SO_3
Pt. cor. w.+R. of comb. Cl=21.103
Pt. cr. w.................=21.073

.030 KCl+NaCl

Paper w.+R. of K_2PtCl_6=.584
Paper. w. ....=.545

KCl 039

.039×.3065=.0119535×.6320=.00755461200÷.500=.0151×100=1.51% K_2O

.30—.0119535=.0180465 NaCl×.5308=.009879082÷.500=0.0197×100=1.97% Na_2O

SiO_2 =60.00
Al_2O_3 =15.97
Fe_2O_3 =3.97
CaO =1.30
MgO =2.58
K_2O =1.51
Na_2O =1.97
SO_3 =0.69
TiO_2 =2.76
H_2O =9.20

99.95

In H_2O loss 9.20 is inclosed the CO_2 and other organics, which is driven off by the heat.

A. MALINOWZKY.

THE CHICAGO SITUATION.

UNLESS SOME CAUSE, at present unforeseen, intervenes in the coming months, 1916 bids fair to break all building records in the city for recent years at least.

Since early in March the figures of the building department for week after week both as to number of permits issued and the amount of investment involved, have far exceeded the figures for the corresponding week of 1915. Just the cause for all of the activity, has not been entirely clear, as the Chicago building market never has been classed as anything of a "War Bride." It cannot even be explained as a part of the "preparedness movement"—getting ready to receive the remnants of Europe's population, fleeing from the wreck and ruin which will remain after the war is closed. Activity in construction of apartment dwellings might be explained by the anticipated increase in birth-rate which is said to accompany all great world-wars, were it not for the fact that the most popular dwelling appears to be the two and three-room apartments with the hidden bed of hibernian cognomen, and a kitchenette instead of a bassinette.

There must be something substantial in the movement, however, and represent to a considerable degree at least, normal growth, development and demand. This would appear to be the case especially in view of the fact that some of the less optimistic have sought to discourage too great activity at this time.

On May 21, Sunday, the following appeared prominently on the real estate page of the Chicago Tribune, stated:

That building operations continued on a large scale, despite the growing conviction that the city is suffering from overbuilding in the downtown as well as in outlying districts, is shown by the figures of the city building department for last week. During the past week there were 224 permits issued for a total estimated cost of $3,342,400, as compared with 181 and a total cost of $1,743,100 for the corresponding week for 1915.

The following week showed still more permits taken out—243—calling for an estimated expenditure of $2,915,200. The week ending June 2, showed a total of 205 permits as compared with 146 for the corresponding week last year, and a contemplated expenditure of $2,443,850 as compared with $1,529,050 for the week of June 4, 1915, and still the increase goes merrily on.

A well organized development of new subdivisions on the installment plan basis, on the part of large real estate interests, accounts for a part of the present building industry, but only for a part of it. New manufacturing plants and various industrial enterprises play an important part, not only directly, but also indirectly, necessitating additional housing facilities for the added population. The activity is so general instead of being confined to one or two fields, that theorizing becomes rather difficult.

The Central Cold Storage Company has announced that it will erect a new warehouse of fourteen stories in height, at the southwest corner of Dearborn and Kinzie street. The cost will be about $700,000.

The Ogren Motor Works has chosen for its new home a site at Sacramento boulevard, Chicago avenue and Grand avenue. The building is to have brick and terra cotta frontages on all three streets. It will be of mill construction and three stories in height, the first floor being used for showrooms and offices and the upper stories for factory purposes.

The great growth of Chicago and the beautifying of its shorelines and playgrounds, has given it a vogue both as a summer and winter resort which is resulting in adding constantly to the number of its attractive hotels in the outlying districts. The most recent announcement along this line is of the Parkway Hotel to be erected by the Loot Hotel Company at the northwest corner of Lincoln Park West and Garfield avenue, at a cost of $550,000. It will be of brick exterior with stone and terra cotta trim, ten stories in height and contain 225 guest rooms, each with private bath.

Added to this, apartment buildings of every variety and location, but chiefly of the two, three and four-room type, individual residences, and all sorts of industrial and commercial building, combined store, theater and apartment buildings, etc., and one has a fair idea of what is going on among the builders in Chicago just now. Needless to say brick plays a constantly greater part together with terra cotta and fireproofing, and the heart of the dealer is glad and asks fervently for no let-up, until snow-fall. SCRIP.

IMPORTANT GOVERNMENT BULLETIN.

"The Feldspars of the New England and North Appalachian States," is the title of Bulletin 92, just issued by the United States Bureau of Mines, Department of the Interior.

The author, A. S. Watts, says: "The Bureau of Mines has been conducting an investigation of the feldspar resources of the New England and North Appalachian states with a view to greater efficiency and economy in their utilization. Such an investigation was deemed necessary, not only because of the continued and increasing consumption of these minerals, but especially because of the demand for better technical control of the raw materials that are used by the white-ware industries of the United States. Most manufacturers of white pottery wares have only a limited knowledge of the origin, mode of occurrence, and methods of mining and preparation of the materials that they use.

"Heretofore, owing to a belief that the supply of raw material was unlimited, the manufacturer had concerned himself chiefly with the solution of the problems of manufacture. Within the past few years, however, it has been found that difficulties arise in manufacture which can be traced beyond the manufacturing process and are believed to be due to a need of better control of the materials used.

"Furthermore, as competition becomes more severe, more attention must be paid to selection of materials in order to minimize consumption and also to avoid unnecessary expense for transportation of material.

"Doubtless the lack of interest as regards these details has arisen from the fact that in the past a considerable proportion of the white-ware ingredients has been imported and the manufacturer has been forced to rely on the samples submitted and the general uniformity of the source of supply to insure against variation of the material. An extra precaution arising from this lack of definite knowledge still prevails in the common practice of never depending on one source of supply for any one ingredient. Often the products of three or more producers are blended so that if any one shall vary without warning, the variation arising from its use will not be sufficient to ruin the ware.

"As the use of domestic materials has increased, the manufacturer has generally depended on the results of tests of samples submitted. The crude materials differ so greatly from the materials purchased, and the treatment necessary to prepare crude material for use involves such an intimate acquaintance with its peculiarities that the users had further cause to neglect to acquaint themselves with the details of its mining and preparation.

"The investigations presented in this bulletin have been undertaken by the bureau with a view to a better understanding of the conditions which confront the producer of commercial feldspar and also with the object of determining wherein the various deposits of feldspar differ. This information will enable the manufacturer to choose the source of supply which is best suited to his needs, and in case a change is necessary to choose more intelligently the location from which to draw for his future supply."

This bulletin may be obtained free of charge by addressing the Director of the Bureau of Mines, Washington, D. C.

Written for The Clay-Worker.

PACIFIC NORTHWEST CLAY NOTES.

THE GENERAL SITUATION in the Pacific Northwest is best summed up by an item in Pacific Builder and Engineer: "Notwithstanding frequent indications that a revival of building operations in the Northwest is due to take place, it is evident from the latest returns that the section as a whole is to be disappointed for yet a while. Portland and Seattle each show a falling off and quite a sharp decline for the year to date as compared with the similar period of last. Tacoma, both for the month and year compares favorably with last year, but Spokane while still indicating a favorable balance over the first four months of last year, slumps heavily from month to month. War may have materially increased the prosperity of other sections of the country at large, but it is evident that peace conditions will suit the northwest very well. It is rather trying on patience to be cheerful pending the time when the most prolific stretch of country in the nation will come into its own again, yet there is cheer in the thought that better days are coming, whether war continues or ceases. The Northwest produces so much that the world at large needs, and has such capacity for increasing its output, that it can not be denied for long. When the demand fully develops, it will not require a war or other abnormal condition to sustain it."

As a sign of better conditions among the clayworkers in this section as far as their personalities are concerned, and that associations are a good thing, it must be reported that the clayworkers of two of the largest centers in the Pacific Northwest have agreed to maintain their prices. Portland and Seattle have both now a central agency through which all clayware is bought and sold. It is to be hoped that the local manufacturers in the smaller towns will follow also, and by doing so, put the clayworking industries of the Pacific Northwest on a living basis.

Among the new companies incorporated is the Wenatchee Brick & Tile Co., of Wenatchee, Wash. The company has not completed its plans, and will manufacture brick and drain tile next year.

The Denny-Renton Clay & Coal Co., of Seattle, have opened a branch in Tacoma and H. J. Crowe has been put in charge. This company secured the largest order in its history for paving brick, which amounts to over seven millions and to be used on the county roads around Seattle in King county.

The Pacific Face Brick Co., of Willamina, Oregon, has moved their Portland office from the center of the city to their city yard, where they have constructed a new office building, built strictly of Pacific face brick materials.

There is some clay in Oregon which may some day be very valuable. It has been examined by experts of the Oregon Agricultural College and also by the United States Assay Office of Denver as containing pitchblende. A Denver chemist has obtained some additional samples and he thinks that the clay contains radium. If some future tests are successful, the deposit will be fully developed.

The Warrenton Clay Co. has arranged with the Spokane, Portland & Seattle Railway to put in its spur switch. It is reported that the machinery from the Marshalltown, Iowa, sewer pipe plant will be used in this plant. Mr. Warren Overpack is the manager.

Pacific coast magnesite is now in great demand with Eastern steel factories. Mr. Cummings, president of the Western Magnesite Development Co., with mines at Patterson, Cal., has made arrangement with the American Refractories Co., of Illinois, for a large contract amounting to $70,000.00. Over 25,000 tons of magnesite have been contracted for and more will be shipped if delivery can be guaranteed. SIWASH.

SPREADING THE DOCTRINE OF DRAIN TILE.

In addition to the supporting testimony of what has been attained by the use of drain tile in five or six states that have indulged in it extensively, there is an encouraging thought for further effort in the exploitation of drain tile by the wonderful results that have been accomplished in spreading the doctrine of the silo.

There is nothing in connection with farm improvements that has made more wonderful progress the past few years than the silo idea. It is a modern idea, a good one that took slowly at first and gradually gained headway until, finally, under the stimulating effort of many dealers and manufacturers becoming interested in it here and there all through the country, it has developed into one of the biggest ideas of the day in connection with the farm.

It is a peculiar fact that the silo development originated in practically the same territory which was first to take up tile drainage earnestly, and in a way the two go hand in hand—they are both modern ideas based upon scientific investigation and they stand for progress and the higher order of farming all around.

What it is desired here to get out of this linking of the silo business and the drain tile business together is a little extra encouragement for more effort on the part of those interested in the welfare of the drain tile business to spread the doctrine of tile drainage. What has been done in silos is illustrative of what can be done, and it should be interesting to study how it was done, with a view to getting ideas that will help boost tile.

Quite a lot of exploitation of silos was accomplished through co-operative effort between manufacturers and dealers. Incidentally, of course, agricultural departments have helped the cause along, but a lot of the real progressive work of salesmanship has been done by representatives of manufacturers in co-operation with retail dealers. Quite commonly, these retail dealers were dealers in lumber and building material, and it is a matter of interest to know that the same dealers also handle drain tile.

Therefore, the suggestion it is desired to offer here is that the drain tile manufacturers seek for co-operation with retail dealers in lumber and other local dealers who may be interested in handling drain tile, with a view to spreading the doctrine of drain tile so thoroughly and effectively that it will mean a great boom in its use before another year has rolled around.

In most of the country where the retail dealer is a prominent factor there comes what is termed a dull winter season, a season of cold weather in which outside building operations are practically discontinued and the lumber and building material business generally is dull. There is nothing much doing, just a little odd bit of stuff here and there, therefore, the retailer has plenty of time to turn his attention to something else. Indeed, the average dealer is often much concerned about what he may profitably interest himself in during the winter months. Some turn to grain, some to coal, some to one thing and some another, while others simply sit around a stove and swap gossip with people of the community.

This just naturally makes the winter season a splendid season to get the ear of these dealers and interest them in any proposition that sounds like more business. This means that it ought to be an excellent opportunity to lay out an active campaign for spreading the doctrine of drain tile, to the end that during the spring season this product may be an active item all around and help materially to fill in the dull season with the retailer as well as give the tile manufacturer more to do and a bigger business.

There is plenty of room to work and spread out, there is plenty of good argument that can be advanced and there are dealers established in most all localities who can be gotten to readily. Practically every state has an association of retail dealers, and from the officials of these, lists of their names can be secured, so in reality, the way is actually made very easy for the drain tile manufacturer to get in touch and stir up interest.

What has been accomplished in silo exploitation the past few years is simply a marker to what it ought to be possible to accomplish in the drain tile industry by properly spreading the doctrine of drain tile and getting enough of the retailers interested in pushing the matter.

I Remember! I Remember!

I remember, I remember,
The house where I was born;
The little window where the sun
Came peeping in at morn.
You'd hardly know the old place now,
For dad is up-to-date,
And the farm is scientific
From the back lot to the gate.

The house and barn are lighted
With bright acetylene,
The engine in the laundry
Is run by gasoline.
We have silos, we have autos,
We have dynamos and things;
A telephone for gossip,
And a phonograph that sings.

The hired man has left us,
We miss his homely face;
A lot of college graduates
Are working in his place.
There's an engineer and fireman,
A chauffeur and a vet.,
'Lectrician and mechanic—
Oh, the farm's run right, you bet.

The little window where the sun
Came peeping in at morn
Now brightens up a bathroom
That cost a car of corn.
Our milkmaid is pneumatic,
And she's sanitary, too;
But dad gets fifteen cents a quart
For milk that once brought two.

—Exchange.

The business men of the country are pretty freely indorsing the idea of federal aid for trade schools. The clayworking industry has been indorsing the trade school idea for a long time, so it will naturally find interest in the proposition of the government rendering financial aid for the development of such schools.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

THERE IS A GENERAL improvement in the business as reported by clay products concerns in this territory, which is in line with satisfactory and healthy conditions of other lines of industry. The fact that money is easier has brought about the consummation of plans laid for construction work some seasons past. The confidence in business circles is shown by the fact that substantial structures are being erected at this time, in many cases to replace temporary buildings put up during the period of depression a little while back. Municipalities have taken up construction work in both building and paving, which was delayed by the poor times. The high prices in steel and lumber have been to the advantage of the clay industries. Brick manufacturers in Wisconsin are generally busy and many plants that have been idle in the past have again resumed. Jobbers and dealers report satisfactory business and the prospects for a continuance of this condition are very bright. Building Inspector W. D. Harper reports building operations for the past month in amount of $1,017,718, representing 565 new buildings, alterations, etc. This brought the total for the year, to June 1, to 1,621 permits, representing an expenditure of $5,771,266, as compared to 1,690 permits and $3,912,849 for the same period of 1915. Reports from the state cities show a general improvement in the building lines. Some of the larger buildings in state cities which will be constructed of brick are the $100,000 high school at Antigo, the new Sauk City high school and the $40,000 high school at Williams Bay. This work has been secured by Ricketson & Schwarz, the well-known Milwaukee firm. The Williams Bay school will be unique in that it will occupy only one story, but have large ground dimensions to provide the same floor area as a building of several stories with the usual dimensions. The Appleton Construction Co., of Appleton, will erect a $75,000 brick and tile hotel at Rhinelander. The proposed municipal building at Ripon, to contain the city hall and opera house, will be a solid brick structure, costing $30,000. A solid brick parochial school is being erected for St. Mary's Catholic congregation at Wausau; the I. O. O. F. Lodge No. 2, Milwaukee, will erect a solid brick lodge hall on Tenth street, near Wells street, and the school and rectory for the Sacred Heart Catholic congregation at Marshfield will be of brick. These structures will cost about $35,000 each. The business in brick pavement work has been showing up splendidly this season. An 18,000-yard job at Marshfield is reported by Ricketson & Schwarz. The city of Stevens Point is having four principal streets paved with vitrified block, contracts for which have just been awarded. The usual amount of brick street and alley pavement is being done in Milwaukee this season.

Face brick is moving well, according to dealers in that line, and the large amount of industrial building has improved the business in fire brick. The Wisconsin Face & Fire Brick Co., Caswell Block, Milwaukee, numbers among its recent work the face brick contract on a large theater at Kiel, Wis. The tile work on the new ten-story, $250,000 Waldheim Store building on West Water street, Milwaukee, is one of the big contracts secured by the Milwaukee Tile & Mosaic Co., 135 Mason street.

William Meadows, who has been identified with the Burlington Brick & Tile Co., at Burlington, since it was organized in 1886, has resigned as secretary, treasurer and general manager of the company, which positions he held since 1888. In company with his son George, of Ipswich, S. D., Mr. Meadows will leave shortly for California and will spend most of the next year in travel. Mr. Meadows is one of the oldest men in active business life in the vicinity of Burlington, having reached eighty-three years. J. J. Marquis will probably succeed him as secretary and Henry Storey as general manager.

Activities are about to be resumed at the old Hollandale brickyard, which has been idle for a long time. A new corporation has been formed to work the yard and will do business as the Granite Brick Co. The men connected with the new firm are W. A. Kelly, H. L. Phillips, W. W. Congdon, F. W. Hall, of Madison; Ed Bright, Brodhead, and Geo. W. Limbert, of Hollandale. It is reported that a railroad sidetrack would be constructed to the company's property from the main line at Dodgeville.

John Ringle, president of the Ringle Brick Co., 108 Grand avenue, Wausau, has been elected a director of the newly-organized Wisconsin Auto Supply Co. at that place.

At the meeting of the Fond du Lac district committee No. 3 of the Wisconsin division of the National Builders' Supply Association, held at the Erving Hotel, Fond du Lac, on Wednesday evening, May 24, thirty-eight dealers in building material were tendered a banquet. M. B. Helmer was chairman. Brief addresses were made on subjects appertaining to the work of the association. A district meeting was also held at the Beaumont Hotel, Green Bay, on May 23, with F. W. Hurlbut, chairman, and on May 25, at the Grand Hotel, Sheboygan, with N. J. Nuss as chairman.

Franz Woerfel, aged sixty-nine, pioneer brick manufacturer of Manitowoc, died suddenly recently while at work in the Woerfel Brick & Tile Co. yards on the Calumet road at that place. Death was due to heart failure. Mr. Woerfel was a native of Germany and came to America in 1875. He went into the brick and tile manufacturing business shortly after arrival, which occupation he followed until a few years ago. During the past few years he has lived retired, but usually could be found working about the yard. Mr. Woerfel was one of the early day actors in this vicinity and also a well-known singer. His widow and five children survive.

A. BADGER.

ANNUAL DEMAND FOR MARBLES.

It has been estimated by statisticians that more than 200,000,000 small clay marbles are used by the boys of the United States every springtime. It is a known fact that 125,000,000 marbles are made every year by one clay marble manufacturer whose plant is in Summit county, Ohio. And these marbles are made or rolled by young girls.

The marble manufacturer does not devote his attention to the manufacturing of the "game marble." There are various uses to which the marble is put, and as a matter of fact the size varies according to its intended use. The Standard Oil Company is one of the largest buyers of marbles, and these are used for oil cans and larger sizes are started in graded pipelines to clean out the paraffin which gathers on the side of the pipe as it flows to the tanks.

Clay marbles are used also by the manufacturers of rubber, ink and salt, chemical and powder makers. They are used also in grinding the large stones of the lithographer and by railway supply people. Puzzle box makers are also large buyers of marbles.

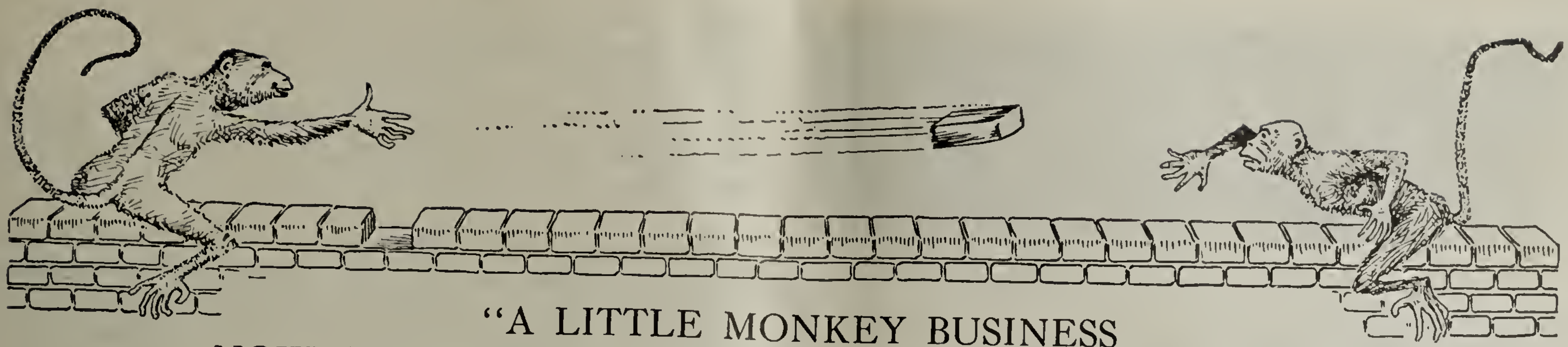
The sizes of the clay marbles as made in the United States vary from nine-sixteenths of an inch in diameter, which is the small "pill" the boys play with, to one measuring six inches in diameter, or about the size of a small cannon ball.

Willing to Play His Limit.

"Father," said the beautiful daughter of the American millionaire, "I wish you would explain to me the difference between a baron and a baronet."

"I don't know exactly," he replied, "but if it's goin' to be more than $500,000 you can just make up your mind that you'll have to take the one that comes cheapest."—Chicago Record-Herald.

Faint advertiser never won fair profits.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Oh, Joy!

The gladdest words
Of pen, by heck,
Are just these three:
"Enclosed find check."

* * *

"Lesh Shaff Annuzzer!"

Here's a new test for sobriety. If a man can say, "She Sells Shiny Sea Shells And The Shiny Sea Shells She Sells Are Sea Shells," he is sober.

* * *

Tuff!

Riches have wings,
The wise men say;
But they don't seem
To fly our way.

* * *

"We're Done!"

"Why is Germany making such a strenuous effort to capture Verdun?" asked Smith.

"I suppose she wants to compel France to say: "Verdun!" replied Jones.

* * *

No Joke.

"Those hypocrites sure make me smile,"
Said wise old Mr. Lynch;
"I find that they preach by the mile,
And practice by the inch."

* * *

Heading Him Off.

"Speaking of trusts," began the stranger, as he leaned up against the counter—'

"Sorry, sir," interrupted the grocer, "but I do a strictly cash business."

* * *

Just Like a Woman.

Omer—My wife always talks until she gets the last word.

Heiny—So does mine—and then some.

* * *

A Forecast.

"What makes you think the baby is going to be a great politician?" asked the young mother, anxiously.

"I'll tell you," answered the young father, confidently, "he can say more things that sound well and mean nothing than any kid I ever saw."

* * *

Twadly Bisted.

The chairman of the committee was addressing a meeting at a teachers' institute:

"My friends, the schoolwork is the bulhouse of civilization, I mean—ah—"

He began to feel frightened.

"The bulhouse is the schoolwork of civ—"

A smile could be felt.

"The workhouse is the bulschool of—"

He was evidently twisted.

"The schoolbul is the housework—"

A snicker spread over the audience.

"The bulschool—"

He was getting wild. So were his hearers. He mopped his perspiration, gritted his teeth, and made a fresh start.

"The schoolhouse, my friends—"

A sigh of relief went up. Hamlet was himself again!

He gazed serenely around. The light of triumphant self-confidence was enthroned upon his brow.

"Is the woolbark—"

And that is when he lost consciousness.

* * *

Mamma's Joke.

"Oh, mamma, the hen is sitting on the vacuum cleaner!"

"Perhaps she's only trying to lay the dust, dear."—Yonkers Statesman.

* * *

Involved.

An inebriated stranger accosted Al Jolson as he was leaving the Garrick Theater and inquired the way to the Union depot.

"Half a block to your right," replied the comedian. "Then three blocks to your left, four blocks to your right and—"

"Hol' on, ol top," said the stew. "I asked the way to the depot, and you're tellin' me how to open a safe."

* * *

Didn't Have to Ask.

Three-year-old Elsie came from the back door of a neighbor's home, eating a cooky.

"Elsie," her mother reproved, "you must not ask Mrs. Bowman for cookies."

"I didn't ask her muzzer," returned Elsie undisturbed; "I know where she keeps 'em."

* * *

Superior Tactics.

"What did you learn at the school?" the boss asked the fair young applicant for the stenographer's job.

"I learned," she replied, "that spelling is essential to a stenographer."

The boss chuckled.

"Good. Now let me hear you spell 'essential.'"

The fair girl hesitated for the fraction of a second.

"There are three ways," she replied. "Which do you prefer?"

And she got the job.

* * *

What a Difference.

A well-known doctor living in a southern city has great difficulty in remembering the names of his patients, and often gets into embarrassing predicaments.

One day a lady brought her little boy to see the doctor. The doctor greeted the lady very cordially, for he knew her well, but for the life of him he could not recall her name. He examined the boy and started to write a prescription.

Not wishing the lady to know his dilemma, he said: "Er—do you spell your name with e or i?"

The lady was somewhat surprised at this and said: "Why doctor, my name is Hill, H-i-l-l."

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXV. JUNE, 1916. No. 6.

CURRENT COMMENT.

When you feel tempted to talk politics, try talking brick.

* * *

The common brick of today is an uncommonly good product—boost it.

* * *

Cut-throat competition is not only bad business, but it has very little excuse to exist at the present time.

* * *

Spring and early summer building operations have been doing very well, but it is thought that fall building will be bigger yet.

* * *

If we can keep the pork barrel out of the preparedness efforts, the extra taxes required will be paid more cheerfully by the public.

* * *

The output of silica quartz in 1915 amounted to $1,270,835. This product is used for pottery and tile work, also for paints and wood filler and abrasive soaps.

* * *

As time moves forward and events transpire we are reminded that there is perhaps no country on the face of the earth so rich in natural resources and other advantages as this great country of ours, known as the United States.

* * *

The Portland cement production for 1915 was 86,000,000 barrels, as compared to 88,000,000 the previous year, a decrease of about 3 per cent. The consumption, however, was about equal, so cement prices are showing some improvement.

* * *

Recent experiments and discoveries point toward the idea that we may be able to obtain our much-needed potash supply through condensing the fumes of blast furnaces, cement mills and other industrial plants, and obtain in this way a by-product of industry that will be an item of considerable importance to the industries themselves, as well as supply a much-needed fertilizer ingredient.

* * *

There is some consolation in the fact that the steam from the political pot boiling is obscuring the war stories in our daily papers.

* * *

The getting up of a satisfactory uniform bill of lading should be a comparatively simple matter. The great trouble is to get the people concerned of a uniform opinion as to what it takes to constitute the right kind of a bill of lading.

* * *

Instead of lambasting associated effort among the industries, the government is now disposed to legalize organizations that will reduce ruinous competition. The brick trade is in need of something along this line as well as other industries.

* * *

Tabulated figures of the income taxes furnish some interesting data about incomes. For example, the fewest number of people have incomes ranging from $300,000 to $400,000, while the greatest number, with a total of 127,448 people, have incomes ranging from $5,000 to $10,000.

* * *

Nearly every time we turn around these days we hear of something new that America leads the world in or is better fixed in than other countries. We are told, for example, that American seaports are better suited by nature to handle big liners than any of the Old World ports. In other words, that in natural advantages the busiest of the European seaports do not compare favorably with American ports.

* * *

When one takes up the subject earnestly, it is easy to find something inspiring about the possibilities of future development in the use of clay products on the farm. There is really as much room to develop clay products on the farm as there has been in the past to exploit cement for farm uses and there is need for some special research work, followed by exploitation, to the end that all may be aroused to and interested in these possibilities because the farm field is a great and promising field for expansion in the use of clay products of many kinds.

THE DESIRE FOR BRICK PAVING.

Something both of the desire for brick paving and the economy of brick as compared to other forms of paving was illustrated recently in an incident which happened at New Albany, Ind. The city engineer made an estimate for reconstructing Market street, between East Thirteenth and Washington. These estimates showed that a brick roadway would cost $4.04 a foot and that a macadam roadway would cost $3.70, making a difference of only 34 cents as between brick and macadam. It was concluded, therefore, to give the property owners an opportunity to say which they preferred.

Can there be any question as to the decision of property owners, or any one else, facing a comparison of this kind in the matter of first cost, when there is added to this the well-known fact that a properly-laid brick pavement is there to stay and calls for practically nothing in the way of repairs?

Presumably in this instance the item of cost was based on the footage of lot fronts facing the street. However, no matter what the basing unit, it serves to show very strikingly that it only costs a little more to pave with brick, whether it be a brick street or a country roadway, than to build a good macadam road, while in the end the cost is infinitely less where brick is used, because once a brick roadway is properly constructed it is there to stay.

The people being educated and awakened to these facts, too, are doing some thinking for themselves, with the result that where it is desired to do the best and most economical roadway building, whether it be in towns or in the country, the brick paved way is pretty generally conceived now to be the one ideal and the cheapest in the end. In other words, popular favor, as well as established facts, now point to the brick paved way as the right way.

TERRITORY AND DISTRIBUTION.

Every brick man ought to make a careful and thorough study of his territory and distribution. The idea of this should be to economize in freight as much as possible and to keep the distribution of one's product in the home territory insofar as this is practical, because there is a lot of unnecessary freight wasted by one man shipping into another man's territory and the other man shipping into his.

Of course, business is business and sometimes it is practical to get good business at some distance from home and make a profit on it. It is perfectly natural to do this, too, and the argument here is not that this should be neglected, but that we should seek to cultivate earnestly the home territory, and renew the effort every year.

It is never possible for a man to hold his tributary territory exclusively. There always will be somebody outside to buy and some going outside to buy because humanity can never agree on all things, but the fact that it cannot all be held is no argument against striving to obtain and hold as much of the home trade as possible before spreading out into distant territory. The man on the ground in the home territory should be able easily to control the great majority of the trade and to the extent he can do this he is effecting an economic saving in freight for himself and somebody else. If every man in the business, everywhere, will cultivate his home circuit thoroughly, boost the game as much as practical there before spreading out into distant territory, there will not only be less competition and better prices for brick, but there will also be a better chance for profit, because not so much of it will go for freight as becomes necessary when shipping to distant territory. So, no matter how big your business may be or how wide a territory you feel the need to spread out over, your first duty of importance is to work thoroughly the home circuit and see that you are getting all that it is practical to get out of it.

FUSSING OVER CAUSES OF FIRES.

With some of the extremes in the lumber trade paper world who want to advocate lumber for everything at all times, regardless, and would even try to prove that a shingle roof is one of the best safeguards against fire, there is some disposition to fuss a little at the Forest Service because it has apparently refused to lend itself bodily to the boosting of wood products, regardless of whether they should or not.

While the right thinking boosters of the lumber world insist that wood be used where wood is best, they have tied up to this other idea, which would try to convince the world that wood is best for everything. The one idea and the declared purpose in seeking to enlist the Forest Service in the work of investigating the cause of fires and of losses was to establish the argument that more fire losses are charged to shingle roofs than should be. To state it another way, the avowed purpose is to "whitewash" the shingle roof and prove that it is not responsible for so many fire losses.

It is a peculiar fact in this connection that the United States Geological Survey readily lends assistance to collecting statistics on the fire losses of the country and in so far as practical, the reasons why.

The Forest Service might well take up some of the same work, except, perhaps, that it would be two departments then duplicating. One division of the Geological Survey has long been making a study of building operations, and the materials of construction, together with fire losses and has studied these impartially and without favor to any one material. This is the only way it or the Forest Service can either one make a study of such things, and for the Forest Service to give ear to the pleas of the lumber fraternity to help it gather data that will prove its own case and arguments would be for it to play politics in such a manner as to destroy its usefulness and invite censure.

Wrangles of this kind are things that the brick fraternity can stand aside and look upon serenely, because it has nothing to lose and lots to gain. Wherever and whenever the subject of fire losses is taken up and studied seriously the final lesson developed out of it all is that a more extensive use of brick will reduce the fire hazard and the fire losses.

As to the lumber people, there is no question but what they can reduce the fire losses to frame buildings by securing a better order of precautionary measures against fire in construction details and in cleanliness and maintenance, and this might help a little in the argument for lumber. But while about it, the natural question will arise, why not make the structures of brick and still further reduce the danger of loss by fire? To sum the matter up briefly, the more the lumber folks agitate the fire loss question the more they will arouse in the public mind an idea of the need for something different and better, and through this means they will serve to benefit the clayworking industry, because it will direct attention to the one sure bet in the way of fire prevention—build with brick.

A STUDY OF PLASTIC FLOW.

The Bureau of Standards has been making a study of plasticity in a way that is perhaps somewhat different. A series of experiments have been conducted with pottery clays to obtain data in the matter of the plastic nature of such clays. The experiments consisted in forcing mixtures of clays and water through tubes of small diameter and measuring the rate of flow at different pressures.

Considerable force is required to start the flow or overcome the friction between the particles of solid. This friction in plastic flow makes it comparatively easy to determine the difference between the plastic substance in a true fluid, even though the fluid be strongly viscous like pitch.

One of these results of these experiments was to demonstrate that the plasticity of a material depends principally upon the fineness of the solid particles. A bulletin covering the experiments has been issued, known as Scientific Paper No. 278, which may be obtained by anyone interested by application to the Bureau of Standards, Washington, D. C.

A JOB FOR OUR CHEMISTS.

In a report from the United States Geological Survey, telling of the possibilities of the production of oil and gasoline from shale in Colorado, Utah and Wyoming and reminding us that the producing of oil and shale is an industry fifty years old in Scotland, there is a suggestion of a job before us, a job of research work for those chemists connected with and interested in the development of the clayworking industry to find out what are the possibilities in the way of by-products from converting our clays and shale into brick.

The report in question says that there are shales in the territory mentioned containing materials which, when heated, can be converted into crude oil, gas and ammonia. So far, the high cost of distilling shale, as compared to the crude oil from wells, has prevented the developing of this industry, but the idea is advanced that in the future we will develop it and we will find in our shale beds enough oil and gasoline to last the country indefinitely. The shale oil, it is said, will yield an average of 10 per cent of gasoline, 35 per cent kerosene and a large amount of paraffin, and ammonia as a by-product. It is said that a ton of shale will yield as high as a barrel of oil which would make ten gallons of gasoline by present methods of extraction, and larger amounts may be possible by a new method. It is also suggested that the ammonia can be used in our fertilizing industry, and it is contended that the development of this enormous reserve simply awaits the time when the price and methods of economy make it commercially practical.

Now it is naturally assumed that this shale is of a peculiar character and differs materially from the usual clays and shales used in making brick. But just the same, it suggests possibilities in the way of developing various by-products in connection with the brickmaking industry. It is necessary to heat all these products in the making of burnt clay of any kind, and there are gases given off, and perhaps many by-products that might be obtained if we could once get a line on the possibilities and some idea of the methods necessary to make this practical. It is hardly necessary to recall in this connection that in the cotton industry and in the oil industry itself the most valuable features have been developed in by-products which formerly represented a waste item, because we are learning every year that we have only touched the possibilities of our natural resources.

The most impressive idea obtained from this incident is that there are possibilities in the way of obtaining by-products from the process of reducing clay and shale to brick, and there is an interesting job before the chemists of the clayworking industry in finding out just what these possibilities are. It suggests that much of the research energy of the industry may for the next few years be profitably turned toward by-product possibilities and not all centered on methods of clayworking to get the brick and burned clay products alone.

IOWA STATE COLLEGE TO ENCOURAGE THE POTTERY INDUSTRY OF THAT COMMONWEALTH.

The Iowa Clay School at Ames, Iowa, contemplates employing an expert potter and ceramic engineer to aid in the development of the pottery clays of that state. Professor H. F. Staley, of that department, predicts that Iowa will become one of the greatest art pottery producing states in the Union, if her unlimited and high-grade clay deposits are developed and utilized. A display of the work in art pottery turned out by the university will be exhibited at the Iowa State Fair in 1917.

NEW HOME OF THE ILLINOIS CLAY SCHOOL NEARS COMPLETION.

The ceramic department of the Illinois University at Champaign is soon to occupy its new home, an immense building erected especially for it, and which is constructed almost wholly of ceramic products. The exterior of the building is particularly imposing. It is faced on the exterior with rough texture brick from the kilns of the Western Brick Company at Danville, which are graded for color. The lighter shades of brick are used in the lower courses, and the color scheme is carried upward, growing gradually darker, making a very rich effect. It is trimmed with terra cotta and a red tile roof contrasts beautifully with the surrounding trees and foliage.

The interior is also very attractive, particularly the main corridor. It and the stairway are floored with decorative clay tile, making it a very appropriate structure for the ceramic department, which will occupy most of the first and second floors. The department will move into the new building during vacation period and the building will be dedicated soon after the beginning of the fall term.

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A great many people are making inquiries and venturing opinions as to what will happen to our commercial and industrial life when peace comes to Europe. Somehow, we have a feeling that while there are lots of things calling for thought and attention, to keep things adjusted for smooth working, there is really nothing much in this proposition to worry about or grow apprehensive over.

* * *

We have the statistical department of our government for authority that little old New York now leads all other ports of the world in commerce. New York is now showing an aggregate annual trade going and coming that runs above $2,000,000,000, which puts it a couple of hundred million ahead of London and leaves London now in second rank.

Spirit of '76—"I fought against my mother country to create this flag. Would you fight against yours to preserve it?"

Suggestion for the Hyphenates in Collier's Weekly.

To Ignore a Chance to Save is as Bad as Throwing Away Money

AS DRY AS A DESERT

DRYING AT LOW COST

If your drying is costing you anything at all for fuel it should be of inetrest to you to investigate the merits of the American Waste Heat Dryer.

If you could bottle up and use the waste heat from a desert, it would be only a trifle cheaper than it is to use the waste heat and gases from your cooling kilns.

This is the most economical method of drying on the market and The American Waste Heat Dryer has exclusive features which simplify and cheapen the operation.

With this dryer your products are made as "Dry as a Desert" in the least possible time.

For tender clay we build a special dryer, while for soft mud brick we build our American Pipe Rack Dryer.

Send for our Dryer Bulletin and let us give you an estimate of the cost of construction of a dryer to meet your every requirement.

The Haigh Continuous Kiln

There isn't any use to continue your present extravagant cost of burning. With the Haigh Kiln you can save fully a half of the cost of burning by old methods. In Europe, where war has made every economy a necessity, they are using practically nothing but this system of burning. If the Continuous Kiln is advisable in impoverished Europe, why isn't it worth your while to make the saving here in the United States.

Don't wait for the bursting of shells and the bombardment of cities before the advantages of the Haigh Continuous Kiln strike you. We have a nice catalogue that tells all about the Haigh Kiln. Send for a copy and let us give you an estimate of what a Haigh Kiln will cost you. It can be made small and grow larger as your plant demands increase. It pays for itself in its daily saving.

The American Clay Machinery Co.

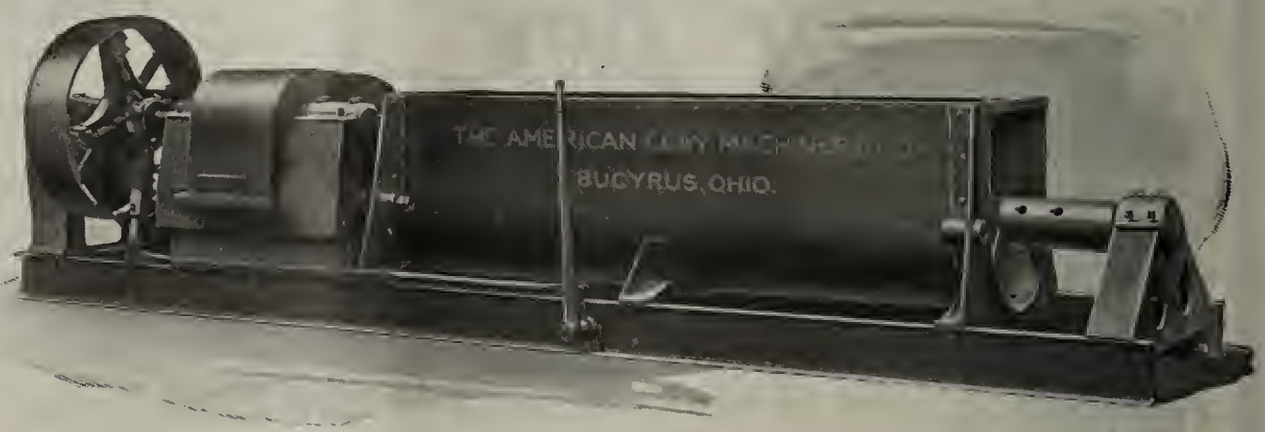
BUCYRUS, OHIO

Built Right Run Right

That Little Want of Yours Will Please Us Mightily. Send it Along.

Much the Largest Manufacturers of Clay Machinery in the World.

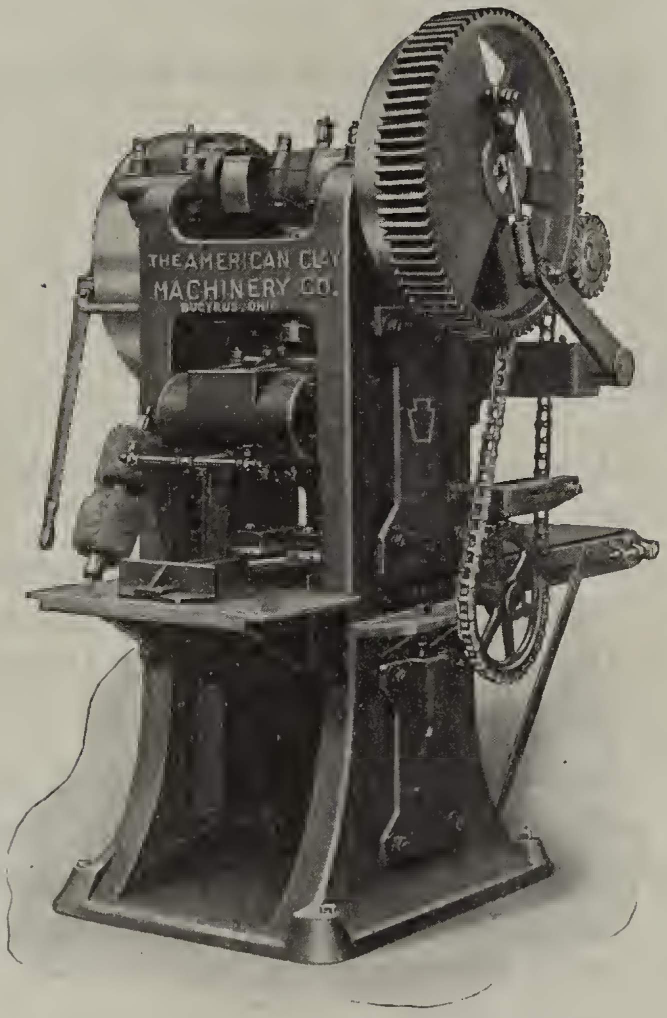
American No. 219 Pug Mill



For the manufacture of Paving Blocks and other stiff mud products, we can highly recommend the American No. 219 Pug Mill. This Pug Mill is one of our newly designed series and has many features of superiority which insure capacity less cost of operation and thorough pugging.

If you have a pug mill need it will be a distinct advantage to you to send for our Pug Mill Bulletin which tells in detail how our pug mills are built.

American No. 292 Repress



The American No. 292 Repress has inherited the good qualities of the old and favorite Eagle Repress, beng a new and improved model of that always faithful machine.

While the Eagle furnished the foundation for this new machine, it is a radical departure in both design and detail and is much superior to it's justly celebrated predecessor.

In addition to other excellent features the American No. 292 Press retains the "staying qualities" of the Eagle and has already become the favorite Repress with the most prominent paving brick manufacturers.

Let us send you our Repress bulletin. We also make every machine and appliance used in the clay trade.

The American Clay Machinery Co.

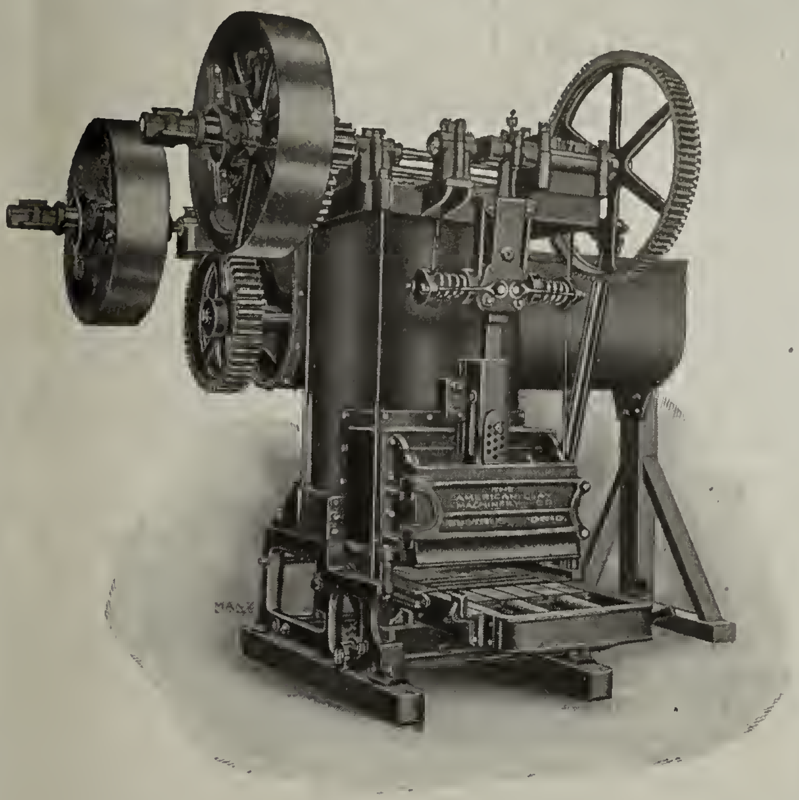
Bucyrus, Ohio.

Built Right Run Right

We Appreciate the Small as Well as the Large Orders.

The American Clay Magazine is a Live One. Its Yours for the Asking

American Soft Mud Brick Machine



For the manufacture of soft mud brick we build a full line of machinery and appliances, including molds, sanders, dump-tables, trucks, etc.

Our Upright Brick Machine is staunch and dependable and will produce a maximum quantity of first-class brick at a minimum of cost.

This machine has many features of merit concerning which we will be pleased to write you. Our Soft Mud Bulletin gives a complete description of our soft mud outfits. It's yours for the asking.

Pipe Rack Dryer

Our Pipe Rack Dryer is without question the best dryer built for drying soft mud brick. Its economy and simplicity has won high praise and imitation, which is only another evidence of its worth.

We have printed a special catalogue descriptive of The American Pipe Rack Dryer and we will be pleased to send it to you on request.

The first cost of this dryer is a feature that will interest you and the low cost of operation is a continual saving which becomes a daily benefit to you.

We will be pleased to give you a list of users, together with an estimate of cost and operation expense.

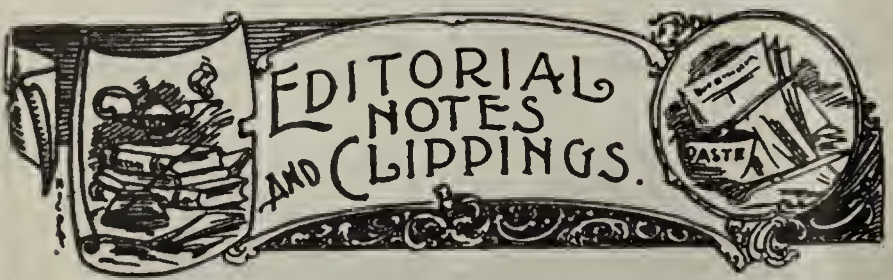
We build every machine and appliance needed by every clayworker. Correspondence solicited.

The American Clay Machinery Co.

Bucyrus,
Ohio

Built Right Run Right

Try Us on Your Little Needs and Remember us on the Larger Ones



EDITORIAL NOTES AND CLIPPINGS.

Greeneville, Tenn., is to have a 5,000,000 brick plant.

The Kansas City Vitrified Brick Company, of Kansas City, Mo., has been incorporated with $50,000 capital stock.

The American Clay Machinery Co., of Bucyrus, Ohio, has under construction an addition which will increase the floor space of the shops 18,000 square feet.

G. O. Barlow, one of the officers of the Warrenton Brick & Tile Company, Warrenton, Ore., announces that the company will establish a branch plant at Marshfield.

James A. Close, of Woodstock, Ontario, Canada, would like some information relative to machinery for making clay insulators for telephone and telegraph work, including the cost and capacity of such machines.

W. C. Vittum, of Ottawa, Ill., has plans under way for the establishment of an immense fire brick plant at that place. He has taken a fifty-year lease on 351 acres of clay and coal land and will mine both coal and clay.

The Vincent Clay Products Company, of Fort Dodge, Iowa, closed down the plant the first of June for a couple weeks for the purpose of making a number of extensive improvements, including the installing of some new machinery.

F. A. Taber and L. B. Flesher, of Grand Rapids, Mich., will establish a drain tile and sewer pipe factory at Grand Ledge, Mich., and have ordered the equipment for same from the American Clay Machinery Company, Bucyrus.

The Greenville Tile Company, of Greenville, S. C., recently landed a contract for sidewalk paving brick for the city of Asheville, N. C., aggregating more than $10,000. This company has been making a specialty of brick for sidewalks.

The Augusta Vitrified Shale Brick Company, Augusta, Ga., has been incorporated with a capital stock of $100,000 to manufacture brick, tile and pipe. John C. and W. K. Hagler, Augusta, and J. I. Hankinson, Aiken, S. C., are stockholders.

The Stevens Pottery Company plants at Stevens Pottery, Ga., including both the pottery and the brickmaking plant, were almost completely destroyed by a fire that came near wiping out the town. The loss is pretty well covered by insurance and W. C. Stevens, owner of the plants, announces that they will be rebuilt at once.

After strike troubles lasting several weeks, every department of the Decatur Brick Manufacturing Company's plant at Decatur, Ill., began full operations June 5. E. D. Mattes, general manager of the company, reported that about half of the old employes were at work and the rest of the force were new men who would soon work into the working organization of the plant.

Construction of the plant of the Dennison Clay Company, one mile east of Dennison, Ohio, is progressing rapidly, the machinery building being nearly completed and work started on the dryer and kilns. Operations will begin in about sixty or ninety days. The capitalization of the company is $120,000, consisting of $60,000 common stock and $60,000 preferred stock. Officers of the company are F. P. Rundell, president; George B. Drennan, vice president, and W. M. Hill, secretary.

The American Manganese Steel Company, Chicago, Ill., has purchased the plant of the Brylgon Steel Casting Company at New Castle, Pa., a large up-to-date steel foundry with a monthly capacity of approximately 400 tons of steel castings. The newly-acquired plant is being converted into a manganese steel foundry as rapidly as possible, and will probably be producing by July 15. This gives the company three plants, two at New Castle, Pa., and one at Chicago Heights, Ill.

The Danville, Ill., branch of the American Refractories Co., which recently began specializing in the manufacture of magnesite brick, is working day and night in the effort to catch up with the flood of orders that come from practically every state in the Union. The company, which recently voluntarily raised the wages of employes 12½ per cent, is gradually increasing its working force and expanding the plant as rapidly as possible. Last week several carloads of the product was shipped to Chile.

The Eastern Clay Products Company is building a large plant at St. Anne, Ill. H. C. Walker, formerly of Byron, Mich., will have the management of the plant.

The Standard Brick Company, of Crawfordsville, Ind., has acquired the right to manufacture the Dunn wire-cut lug brick. The plant has a capacity of 35,000 paving brick per day.

The Terra Cotta Company of Wilmington, Del., has been incorporated at Wilmington, with capital stock of $175,000. The incorporators are F. D. Buck, George W. Dillman and M. L. Horty, all of Wilmington.

Porter C. Ferris, yard superintendent of the Hydraulic Press Brick Company, Brazil, Ind., has been promoted to the office of general superintendent to succeed H. R. Ireland who has been transferred to the Zanesville plant.

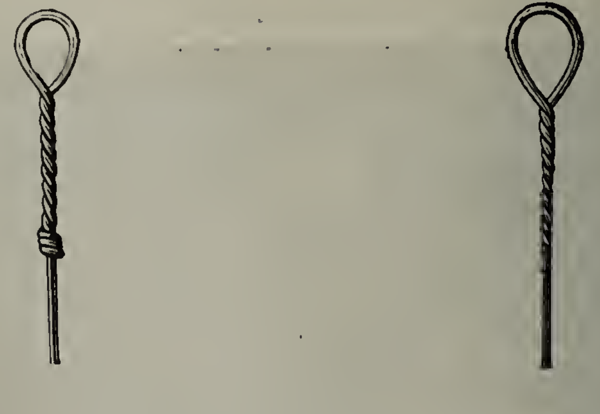
Wm. J. Schafer, secretary of the Commercial Club, of Caldwell, Ohio, writes that he would like to correspond with manufacturers of clay products with a view of securing a good clayworking plant for that city, where they have an abundance of good clay with cheap fuel.

The Chambers Brother Company, Philadelphia, Pa., write that they are comfortably busy, but that labor is scarce, which is proving a serious drawback. This seems to be the common complaint in the eastern states, and a number of the large brick manufacturers are suffering from the same complaint.

The Tennessee Clay Products Company is the name of a new enterprise at Nashville, Tenn. It is the plan of the company to have a capital stock of $50,000, and to take over the old plant of the Harley Pottery Company, which manufactures stoneware, firebrick, flower pots and such other clay products as may be manufactured and sold profitably. Those desiring to secure information in regard to the company can do so on application to Mr. Robert Dyas, at the manufacturers' permanent exhibit building, 213 Third avenue, north, Nashville.

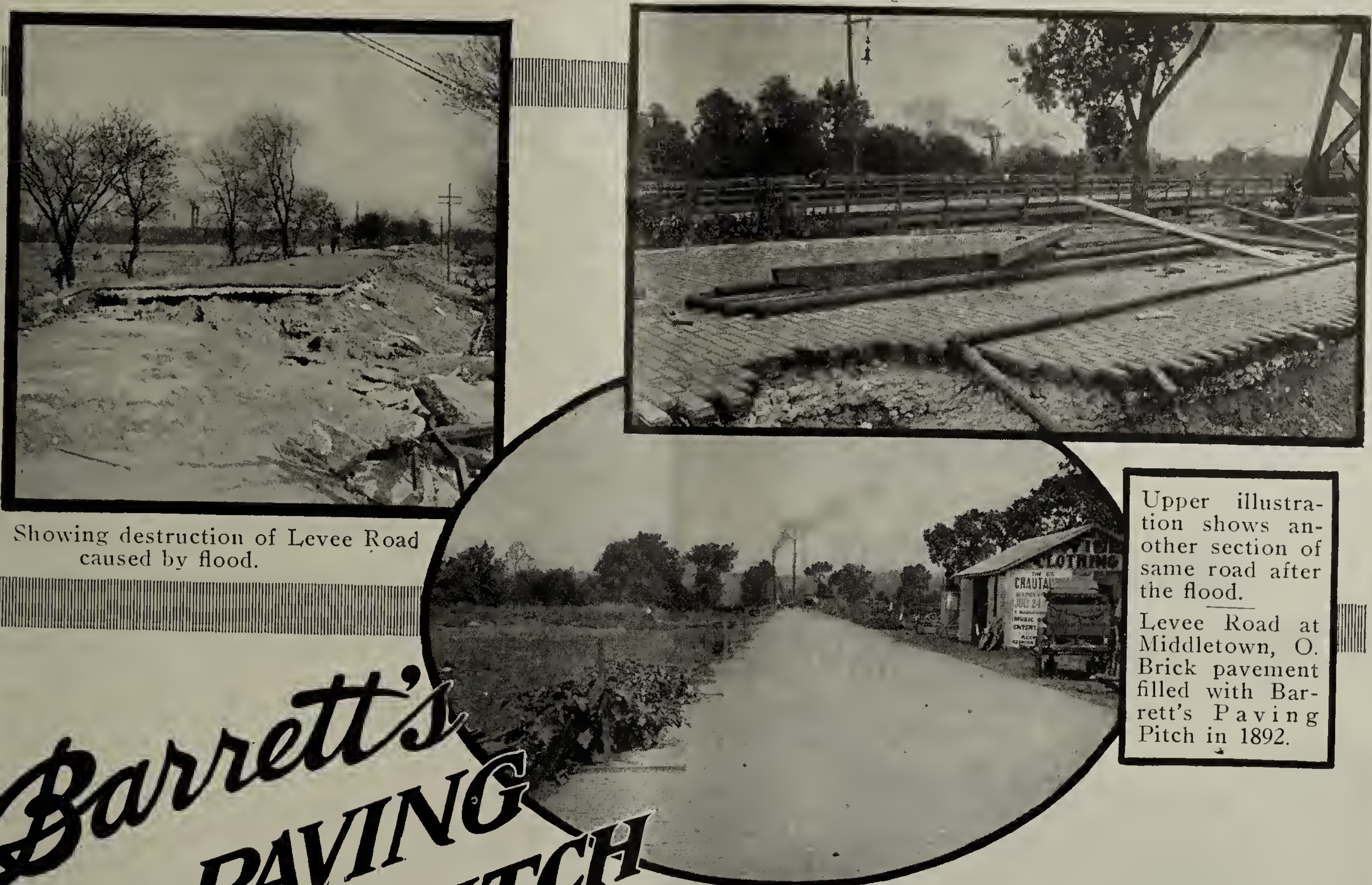
(Continued on page 724.)

We Can Save You Money, Time and Trouble on WIRES



Let us send you samples and prices.
Daily capacity, 20,000 finished wires.

The Mittler Wire Mfg. Co.
Robbins, Tenn.



Showing destruction of Levee Road caused by flood.

Upper illustration shows another section of same road after the flood.

Levee Road at Middletown, O. Brick pavement filled with Barrett's Paving Pitch in 1892.

Barrett's PAVING PITCH

An Extraordinary Test

Twenty-three years ago this road at Middletown, O., was paved with brick and filled with Barrett's Paving Pitch.

Recently a section of the road was damaged by flood and this gave an opportunity to observe carefully the condition of the Paving Pitch.

It still clung tightly to the bricks that were washed away. Samples of it were taken and found to be in exactly as good condition chemically as when new. In fact, if it were practicable to scrape or melt it off the bricks it could be used over again today in a new pavement and would undoubtedly give perfect satisfaction for another twenty-three years.

Pitch is wonderful in its absolute immunity to the action of water. It ranks with gold and copper in its resisting power against the elements.

Service considered, it is the least expensive filler known and the easiest to apply. It maintains a perfect seal against the intrusion of water and frost. It eliminates the ancient expansion problem, for it makes every joint an expansion joint.

Booklets free on request. Address our nearest office.

The Barrett Company

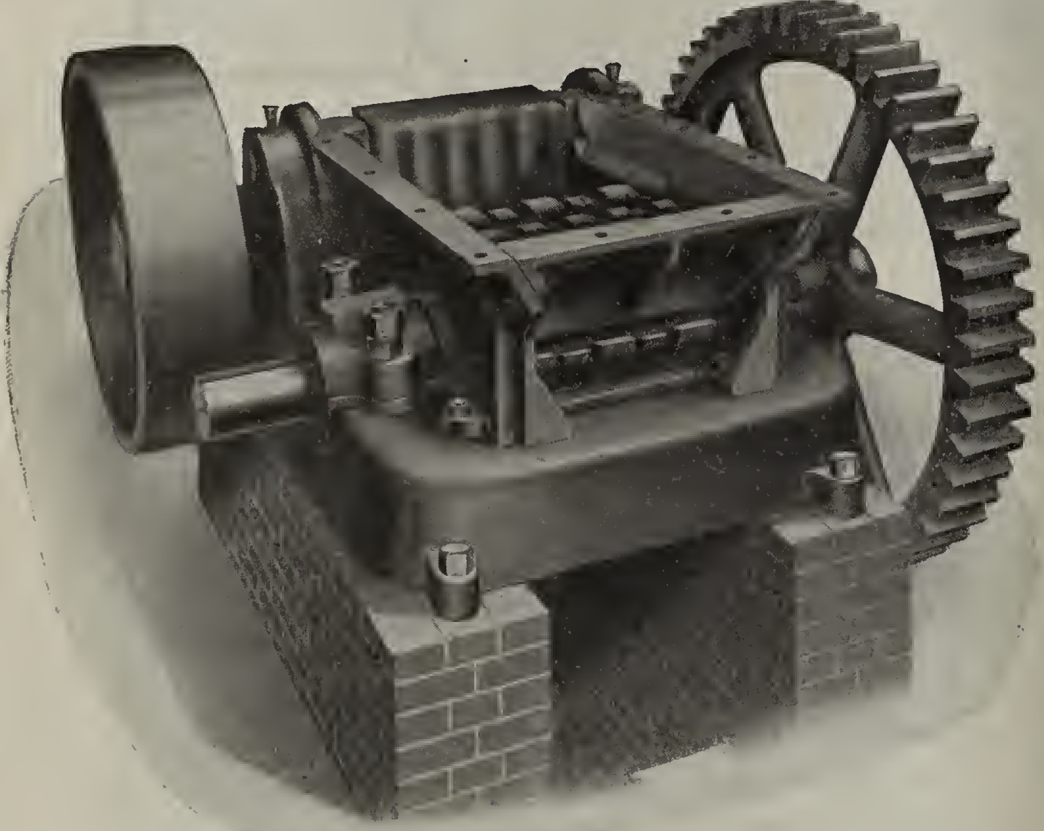
New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B.
Halifax, N. S. Sydney, N. S.

While we are all more or less agreed that a dry pan is built to stand "the racket," and consequently abuse it infinitely more than we would an automobile or other finer or more delicate piece of machinery, yet it is easily possible to overtax its strength and capacity. Such a course must necessarily shorten its life, but not only this—it involves more cost for repairs and maintenance during its shorter life than if it is permitted to live its normal number of years.

How to prevent this business of overtaxing, you ask?

Simply by giving your dry pan the support of a

MECO SINGLE ROLL ROCK AND SHALE CRUSHER



Walkers Mills Stone & Brick Co., of Pittsburg and Walkers Mills, Pa., has this to say about it:

"It not only has enabled us to increase our output, but has been a great saving on our grinding pan. Before installing this crusher we were continually buying repairs for the pan, but since using the crusher we have had very few repairs. We put all the material, including large rocks, which otherwise would have to be broken up with sledges, through the crusher, and in that way get our material more thoroughly mixed, and of course are getting a more satisfactory brick."

In the face of such evidence as this we think it is time that you let us send a copy of our booklet on this crusher. A postal card request will do the work.

The Manufacturers Equipment Co.
The Clayworkers Furnishing House
Dayton Ohio, U. S. A.
Western Agent: Geo. H. Smith, 510 Reliance Bldg. Kansas City, Mo.

EDITORIAL NOTES AND CLIPPINGS—Continued.

E. J. Owens and others will build a pottery at Sistersville, W. Va.

The Platt Pressed and Fire Brick Company, of Van Meter, Iowa, has changed its name to The Platt Company.

The Perkiomen Brick Company, of Reading, Pa., has been authorized to decrease its capital stock from $100,000 to $5,000.

The Maryland Clay Products Co. will erect an immense brick and tile plant at Koontz Run, about two miles from Lonaconing, Md.

George Artambi, an employe of the Lorillard Brick Company, Keyport, N. J., was badly injured when his right hand was caught in the machinery.

The United Shale Products Co., Inc., has been incorporated at Buffalo, N. Y., with $30,000 capital stock, by J. Schmidt and J. and G. Jepson, all of Buffalo.

The Texas City Clay Products Company, of Malakoff, Texas, has been incorporated by Henry J. Scott, D. T. Bomar and E. H. Holcomb, with $75,000 capital stock.

Isaac Wantling, Samuel T. Thomas and William Vaughn and others have organized the Wantling Coal, Brick & Tile Company at Peoria, Ill. The company is capitalized at $100,000.

One man was killed instantly and two others were badly injured when the roof of the kiln at the plant of the Red Brick Company's plant, at Ashland, Ky., was blown off during a wind storm.

The Briggs Company, of Lansing, Michigan, has taken over the plant of the Baker Clay Company at Grand Ledge, Mich., and will turn out a fine grade of face brick, at the rate of 45,000 per day.

Owing to continued high water during the spring season, the starting of the plant of the Saginaw Paving Brick Company, Saginaw, Mich., was delayed six weeks. This factory, which is one of the largest of its kind in Michigan, has a capacity of 1,000,000 face brick per month.

The Mazurie Clay Products Company has been incorporated by J. J. Mazurie, B. E. Ottman, W. E. Elliott and I. E. and W. W. Weel, of Uhrichsville, Ohio. The company which is capitalized at $100,000, will erect a large plant near Uhrichsville for the manufacture of pressed brick and sewer pipe.

The Brick Homes Company is the name of a new concern which has just been incorporated to engage in the erection of fire-safe houses in Cleveland, Ohio. L. S. Conelly is president of the company. The company announces that it will specialize in low priced artistic houses to sell for from $3,000 to $6,000.

Nicholson Brothers, of Chicago, Ill., have purchased the tile plant at Ray, Ill., including twenty acres of good clay which is underlaid with coal. The new owners will demolish the old plant and build in its place a modern tile plant. The work will be under the direction of J. F. Thompson who was superintendent of the old plant for many years.

The Montello brick plant at Wyomissing, Pa., which has been idle for eight years, owing to the financial difficulties which brought the Montello Brick Co. to the bankruptcy court, is being overhauled by a force of men employed by the Wyomissing Brick Co., which has taken over the property. The plant will be put into operation this month, and will, it is understood, pass under the control of the Glen-Gery Shale Brick

YOU HAVE KNOWN FOR YEARS THAT
RICKETSON'S MORTAR COLORS
are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.
Red, Brown, Buff, Purple and Black.
RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

Co., having a large plant at Shoemakersville, in the near future.

The Karthaus Fire Brick Corporation, of Clearfield, Pa., has filed articles of dissolution.

G. K. Hundly contemplates establishing a brickmaking plant at Hopewell, Va., with a daily capacity of about 20,000.

Christian Pothast, for many years a manufacturer of brick by the old hand mold method, in Indianapolis, died at his home in that city recently.

H. A. Bones, Ada, Okla., and W. G. Skelly, Tulsa, Okla., will equip a brick-making plant at Ada, installing a dry press machine and other equipment for a modern plant.

Large extensions being made to the plant of the Clayburn Firebrick & Clay Company, Ltd., Clayburn, B. C., will require machinery to double the capacity of the plant. W. H. Armstrong is president.

Ground has been broken for the new plant of the Municipal Shale Brick & Block Co., of Martinsburg, W. Va., and the contract for all the machinery and appliances has been awarded to E. M. Freese & Co., of Galion, Ohio.

The Lonsdale Brick & Pottery Co., Lonsdale, Tenn., of which A. C. Morris is president, and L. D. Morris, vice-president and manager, has acquired the old Lonsdale Brick Co. plant and purchased machinery to produce 50,000 brick daily.

The fire-brick plant of the Cyrus Borgner Company, at Philadelphia, Pa., was almost completely destroyed by fire June 3 causing a loss which is estimated at $150,000. The fire is supposed to have been caused by spontaneous combustion.

The Southern Brick & Tile Company's plant at Jackson, Tenn., which was closed for some time, is again in full operation with orders enough on their books to keep them running for some time. One order recently received calls for 5,000,000 brick.

The Fields Brick Company, at Chester, Pa., will make a number of improvements in its plant with a view of doubling the capacity. An additional machine will be installed and it is hoped to have everything in running order by the middle of July.

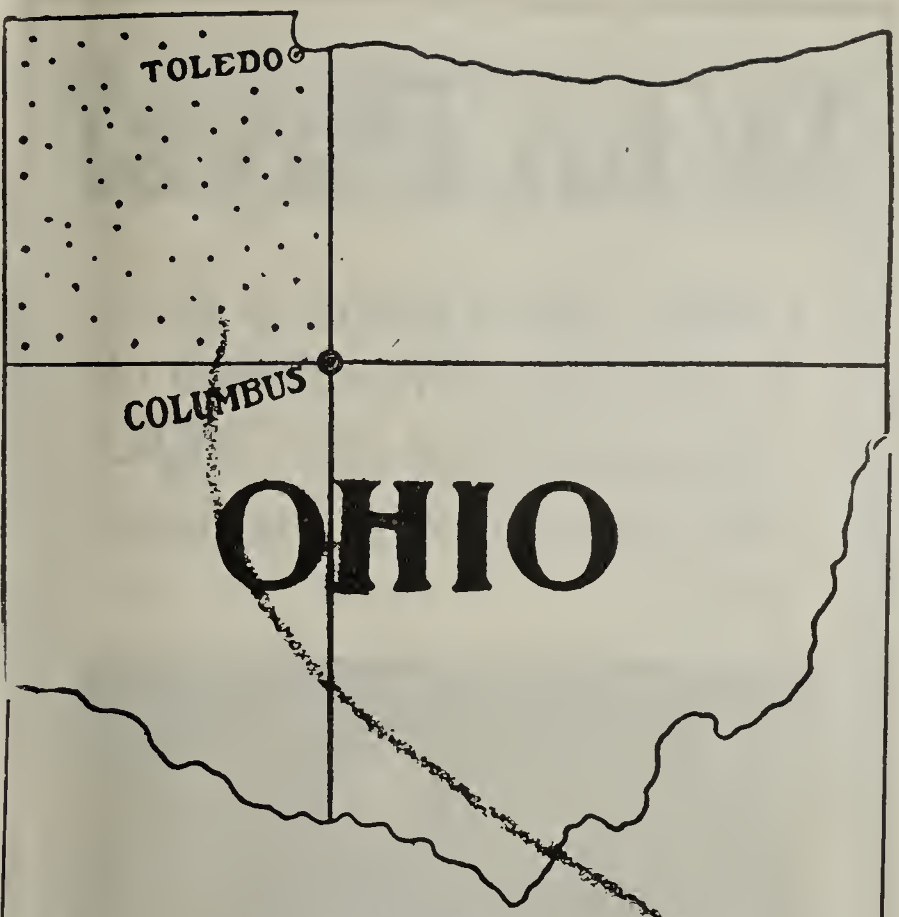
A patent has been granted to F. A. Hoiles, president of the Alliance Brick Company, Alliance, Ohio, for a brick ornamenting device, for which Mr. Hoiles made application some eighteen months ago. He received another patent some months ago and the two cover every desired point for the manufacture of the Alliance Brick Company's famous "Rug" brick.

An employe of the Albion Shale & Brick Company, Albion, Ill., met instant death when a clay car which he and another employe were rocking from side to side to clear it of some clay which had stuck to one side, turned completely over and fell on him. The car rolled on down the embankment and was wrecked.

During a bad storm Saturday, June 3, the huge smoke stack of the Richards Brick Company, Edwardsville, Ill., was struck by lightning and was cracked from the top down 20 feet. A few brick were knocked from the top of the stack. The stack is 175 feet high and has been struck by lightning four times in the past six years. About 30 feet of the stack at the top will be taken down and rebuilt. It will require two weeks to rebuild the stack.

NO. 1
KNOWN
THE WORLD OVER
SCHURS
OIL BURNER CO.
Los Angeles, Cal.

NOTICE!
TO
BRICK MFRS.
FOR
QUICK BURNS
AND
BETTER COLOR
BURN OIL
AND USE
SCHURS
BURNERS



Everybody wants in on a GOOD THING as soon as it is

A PROVEN SUCCESS.

A few years ago in this section of Ohio ONE COMPANY installed our system —today

SIXTY-FIVE COMPANIES

have installed and have our Hook Kilns in successful operation.

Isn't this proof enough that Hook Kilns are efficient TIME and FUEL SAVERS?

The JUDGMENT of these companies is that "Hook Kilns are GOOD." YOU can reduce YOUR MANUFACTURING COSTS by taking advantage of this OPPORTUNITY.

Join the ranks of LOW-BURNING-COST PRODUCERS. Write to us now.

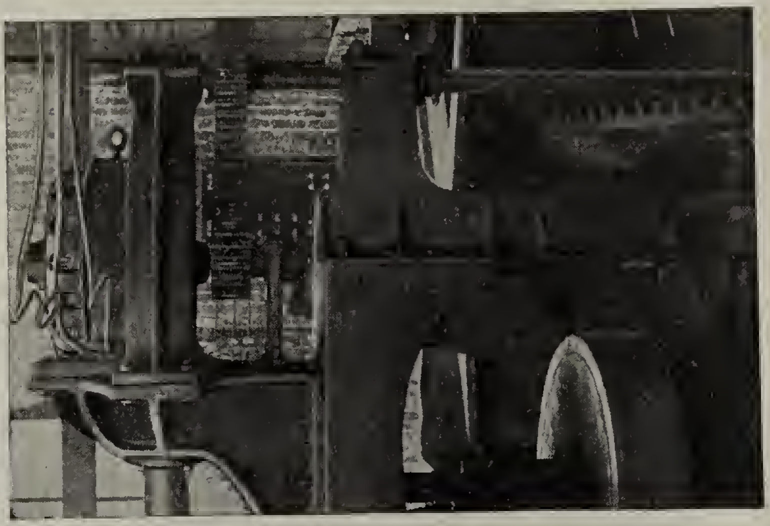
HOOK PATENT KILN CO.
VIGO, OHIO
Canadian Office
250 Dufferin St. Toronto, Ont., Can.

HOOK KILNS ARE OPERATED ALL OVER THE CENTRAL WEST.

EFFICIENCY---DURABILITY---ECONOMY

Who Pays?

for the wasted power to drive the line shaft when several of your machines are idle—YOU—but you can stop this waste with—



Westinghouse Motor Driving a Dry Pan

Westinghouse Individual Motor Drive

Individual motors make each machine an independent unit. You do not have to furnish energy to drive fifty feet, or more, of shafting to operate a single machine.

A card will bring full information

Westinghouse Electric & Mfg. Co.

East Pittsburgh, Pa.

Sales offices in all large American cities.

INDIRECT SALES PROMOTION.

(Continued from page 673.)

was found that the clayworker intended putting in a motor and buying all his power outside.

The staff man produced the report on the tests of exhaust steam referred to above. Investigation by the manufacturer confirmed the report. The motor was not installed.

This clayworker felt as a man does when the lightning just misses him. He found that he could use his steam for power at a loss of but 4 per cent. of its value as a heating agent, and then pass it on to dry his product. He learned that, in a clay plant, power can be obtained as a by-product of drying operations and at a cost far below that of outside juice. He was willing to sacrifice the appearance of efficiency and economy for what he had learned would save him money.

Thus we have a glimpse of the causes underlying the growth of a successful business. Starting with the invention of the wood split pulley, other products were added from time to time, factory equipment was developed to insure accurate and uniform finish of product, designs were improved to meet service requirements, the line was thoroughly standardized, facilities for distribution were perfected, and now comes the service staff referred to above.

This development has resulted from sound policies for the promotion of sales, policies that have grown out of the single purpose to improve the value of product and service to the customer.

While certain principles are applicable to all business, methods of development must vary in different industries. The methods used so successfully by the above company might not be effective in another line, yet in all lines the fullest development requires the same happy combination of conservatism with the courage to rise to opportunity.

As examples of the extremes of methods used for sales promotion we have a railroad company sending along its line a train carrying agricultural experts who teach better farming methods for the purpose of increasing crop yields and the demand for the service for sale by the road, and a manufacturer of pocket knives who recently moved the thumb notch in the blades as nearly as possible to their points for greater ease in opening his knives, thus increasing his sales.

Between these two extremes lie a multitude of methods. Each business has its own peculiar conditions and must have individual treatment. The manufacturer of pocket knives took a very simple and direct step toward increasing business. The railroad, through educational work, strives indirectly for a better market for its service.

It is difficult at times to draw the line between direct and indirect methods of sales promotion. The distinction is really of slight importance except in directing attention to potent influences sometimes ignored. The manufacturers of drain tile recognized one such influence years ago when they labored in co-operation with other public spirited citizens for the enactment of laws to forbid owners of land lying in the natural course of drainage denying their neighbors above them the advantage of adequate tiling. This was a splendid example of indirect sales promotion and resulted in a greatly increased demand for drain tile.

In this instance natural conditions, which often lend themselves readily to promotional effort, proved an active and powerful ally of the makers of tile. They were able to secure the enactment of the desired laws much more readily because the benefits they expected were merely incidental to the greater benefits which accrued to land owners and to the public in general.

Natural influences, which are not always permanent, affect operations in every line of industry. While often they can be made valuable allies, they sometimes offer serious resistance.

As a familiar example of the effects of changing influences on commercial operations, we have the pulley business. When this country had abundant forests and wood was the principal material available for many industrial purposes, the wood pulley, once introduced, was accepted as a very natural and proper item of factory equipment, and was developed to a high state of perfection. The cast iron pulley also was generally available and received its share of favor. In some respects and for some purposes it was a better pulley than one made from wood, while for many other purposes the wood pulley was and still is superior to any metal pulley.

Finally there came greater development in the iron and steel industry. Their superiority for many purposes gave iron and its products a wide field and we heard frequent references to the "iron age."

To the average manufacturer, the words "iron" and "steel" have come to suggest superior strength, capacity and durability. He has seen spring up large buildings that could not have been constructed without the use of steel. He has constantly before him a thousand examples of the great adaptability and utility of a multitude of steel products. Although the life of the locomotive and of other railway equipment, including the steel rail, would be much shorter except for the resiliency of the wood track tie, and although other wood products have been found indispensible, the abandonment of wood for many industrial purposes has been accepted without question and as a matter of course.

As a result of this condition, the manufacturers of metal pulleys are enjoying at present certain selling advantages which bear no relationship to the merits of the two classes of pulleys.

Sometimes we see a state undertake to promote the sale of certain of her products. Iowa produces very little lumber and very much clay products. Lumber and clay products compete for the business of building Iowa's houses, barns, silos, etc. Believing that the clay products industry is handicapped because of the lack of active mason contractors, the Iowa State College has started at Ames a course of study and training to fill this need. The direct result of this work is the education and training of men, but the indirect and more important result will be the sale and use of more building material produced in progressive Iowa.

While great strides have been made in recent years by the clay industry, it has not kept pace, in some of its branches, with other leading industries in the matter of the promotion of sales.

The drain tile manufacturers have been especially favored. There has been little competition from outside materials. Growing population and increased demands for farm products have supplied a natural stimulus to their business and they have not felt it necessary, as a rule, to contribute very much toward the general promotion of their sales.

There are some sales problems confronting them, to the solution of which considerable thought and money can be contributed with profit. That much can be accomplished toward equalizing demand over wet and dry seasons is certain, and that such equalization would greatly benefit the industry is also certain.

Their greatest opportunity, however, lies in the direction of securing the enactment of laws providing means for maintaining public records of maps showing the location, size and character of private farm drains.

The present lack of such laws and the practice of relying on memory for information which should be of public record, has formed a great obstacle to the fullest development of the drain tile business.

Drain tile manufacturers should no longer permit their

(Continued on page 728.)

GANDY

Try Gandy for That Hard Belt Service

WHERE everything is against the belt—where it is subjected to dampness, oils, greases, dust or dirt—try Gandy.

Because Gandy for 37 years has demonstrated that it can stand up against such conditions. Proof is all around you.

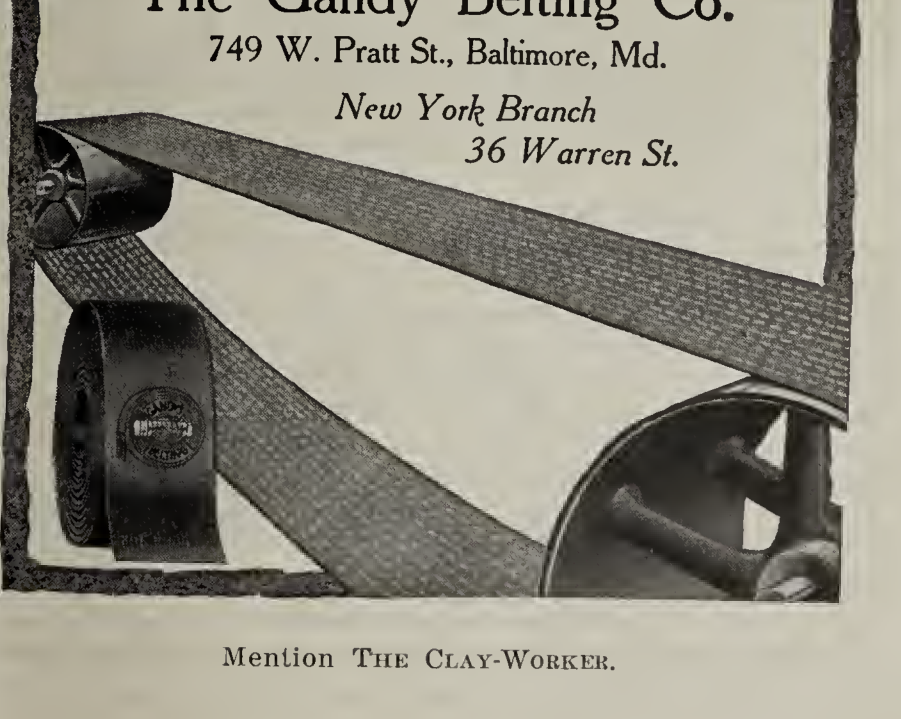
Gandy runs straight and true, and has a tenacious cling on the pulleys that reduces belt slippage and power waste.

Make the next belt a Gandy belt. Be sure you get the Gandy Belt with the Gandy trade mark stamped throughout the length of the roll.

Our stock comprises all widths and all plies, from as narrow and as light as 1 in. 4-ply to as wide and as heavy as 30 in. 10-ply. This means your orders can be filled promptly with well seasoned stock.

Leading supply houses everywhere carry Gandy. Or, write direct to us for a sample and prices. There is no obligation.

The Gandy Belting Co.
749 W. Pratt St., Baltimore, Md.
New York Branch
36 Warren St.



Mention The Clay-Worker.

BURNING CLAY WARES.

(Continued from page 681.)

rapid drop in the curve but beyond these points the downward tendency of the curve would be slower.

Suppose we are burning paving bricks and in one material the soaking heat required to burn the bricks to the bottom of the kiln is approaching a eutectic point, the effect will be a rapid softening of the ware and distortion, in other words a short vitrification range. In another material the final result may be obtained between two eutectic points where the vitrification range would be longer, the rate of softening would be slower.

Clay wares, particularly the common wares, are not burned to complete fusion. Complete vitrification under any definition applicable to clay wares is simply filling the pores of the clay mass with fused material. Three per cent. has been suggested as the maximum limit of absorption for vitrified wares but this is too low. Many vitrified wares run five to six per cent. absorption and some as high as ten per cent. and find acceptance in the markets. The fusion in common wares is far from complete and is stopped short of the point where deformation under weight becomes serious, otherwise the ware would be ruined, but in vitrified wares we go so near the limit that the development or non-development of a eutectic mixture at the finishing temperature may be the factor which determines whether the material is practical or not for such ware.

By the way of an illustration, let us consider a single mineral—lime, for instance—in a clay body. Lime is very basic and an active flux, but potash and soda are even more active. Clayworkers are familiar with the difficulty in burning a limey clay. We have been accustomed to say that lime is not active at a low temperature but at a critical higher temperature it becomes exceedingly active which results in the sudden failure of the clay mass under fire. Any flux increases in activity with increase in temperature but seemingly at a slower rate than lime. We know from the color of the ware that lime has some fluxing action at low kiln temperatures. At some critical higher temperature the fluxing action is so rapid that the temperature range between soft ware and distorted ware is too short for commercial operation. It may be simple fluxing action causing the sudden change but it is likely that a eutectic mixture, equivalent to a sudden advance in temperature, is the cause of the marked decrease in viscosity.

We illustrate the effect in sketch No. 2 in which the upper curve is the theoretical viscosity of a simple fluxing action under advancing temperatures while the lower curve represents the viscosity of the same flux including the development of a eutectic mixture.

Lime with pure kaolin is known to develop two or three eutectic mixtures while feldspar and magnesia do not develop any eutectic. These tests are, of course, on pure materials and do not necessarily apply to such complex mixtures as we have in clay, but undoubtedly, the eutectic tendency of a mineral has material effect on the burning behavior of a clay mass.

From 1800 to 2000 degrees Fahrenheit potassium, magnesium and calcium minerals may be acting as fluxes at the same rate. Between 2000 and 2100 degrees the calcium mineral may develop a eutectic and down goes the ware, while with a magnesium or potash mineral no eutectic is developed and the rate of fusion is a continuation of that at the lower temperature. With one mineral we get a degree of fusion within one hundred degrees, which may require several hundred degrees with either of the other minerals.

(To be continued.)

In this age of efficiency and close utilization the matter of oil economy is entitled to due consideration. Moreover, there is no getting around the fact that it is unnecessary and wasteful to only use oil once to pour it onto or into journals, let it work through them and go to waste. This is a preventable form of waste and there are many plans or ways and means that may be followed, from simple drip pans to the more elaborate flushing and return system for handling oil. Some one of these can be made to fit the conditions at every plant, and they all involve the use of filters for the sake of rousing the oil. Certainly, then, we have pretty conclusive evidence that oil can be filtered and made good as new and that it practically never wears out. It should not require any other argument to convince the plant owner that it is worth while to take such steps as are necessary to get the fullest practical measure of service out of his lubricating oil and thus economize in this item of factory cost.

INDIRECT SALES PROMOTION.

(Continued from page 727.)

product, which in operation forms a most potent asset in the business of their customers, to be buried without even a wooden marker by which to locate its grave. As Mr. Elliott has said in his recent articles in the Country Gentleman, "No visible marks of their existence appear, nor would they be suspected by a visitor, except at their outlets."

We may agree with Mr. Elliott that this peculiarity of tile drains contributes a great deal, as compared with open drains, toward beautifying the landscape, increasing acreage for cultivation and toward simplifying farming operations. We believe Mr. Elliott will agree, in turn, that this condition is unfortunate, however, from the standpoint of publicity, and that some action should be taken to provide means for making the location and extent of these drains a matter of record available to those who would measure the credit to be extended for these invisible improvements, either in buying or renting a farm or in loaning money on it.

Here, again, natural conditions favor the manufacturer, and many agencies will contribute to the enactment and utilization of such laws. Everybody, upon giving the subject careful consideration, takes substantially the attitude of Prof. A. D. Wilson, director of Agricultural Extension of the University of Minnesota, who writes, "The proposition of registration of tiled farms is new to me, but the plan certainly looks feasible. In fact, I can see no objection whatever to it, and can see many important advantages that would come from such registration."

Here is an example of a long neglected opportunity for indirect sales promotion which is of interest not only to drain tile makers but to farmers, state and national agricultural departments, lenders of money on farm security and to everybody interested in the improvement of farming conditions—and that touches most of us.

Thus we see that "sales promotion" operates along both direct and indirect lines; that in some of its phases it can be carried on profitably by the individual, while in others it presents an opportunity and a task demanding the attention either of a huge and controlling combination or of a strong association of independent manufacturers; that it may enlist a state or nation when benefits are promised to her industries.

Sometimes it is fraught with hazards as great as are met in other forms of pioneering. At other times it may operate along lines so obvious and direct that effort required may be predetermined and the nature of results anticipated.

In its many forms, and most effective when expressed in terms of definite policy, sales promotion will be found the influence underlying all commercial progress. It builds a nation's industries and arms its citizens that markets may be held or other markets won. Among its instruments are found the printed page, the written law, the hand of service, and at times the submarine.

While its purposes are constructive from the standpoint of those directing its operations in a given instance, its effects on competition may be destructive. As in other forms of warfare, both offensive and defensive activities are important and a handful of "beating the other fellow to it" often is worth a whole carload of regrets.

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WANTED, ETC.

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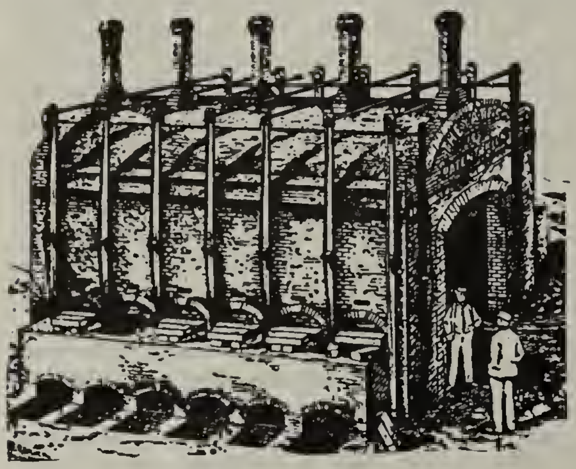

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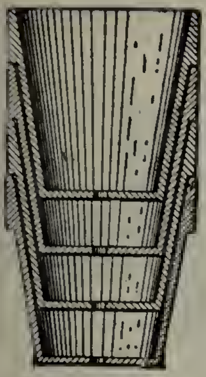

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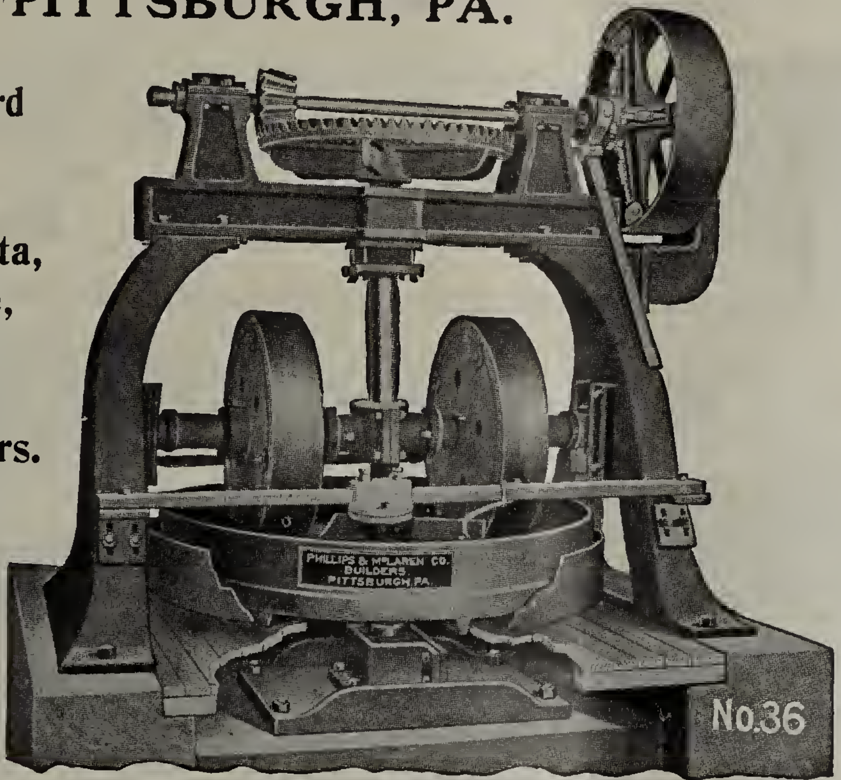
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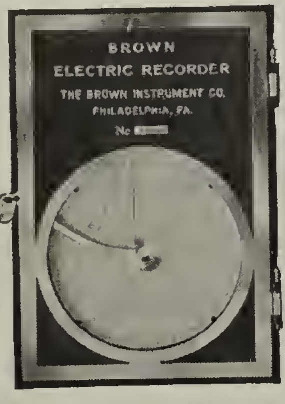
The... Clay-Worker.

RATES

For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of seven words to line. Head line counts as two lines.

PYROMETERS



A Brown Pyrometer on your kilns will pay for itself in two months in the saving in fuel alone, not to mention better ware produced.

Send for 56 page Catalog No. 17

BROWN INSTRUMENT CO.
PHILADELPHIA, PA.
New York Pittsburgh Chicago

Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special"
Clay Feeder

Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your off-bearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Soiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

The Old Way

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen, Lew Wallace, the author of "Ben Hur," wrote: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

ADDRESS THE CLAY-WORKER, INDIANAPOLIS, IND.

The New Way

PATENTED

Metallic Radiation Heat Dryers

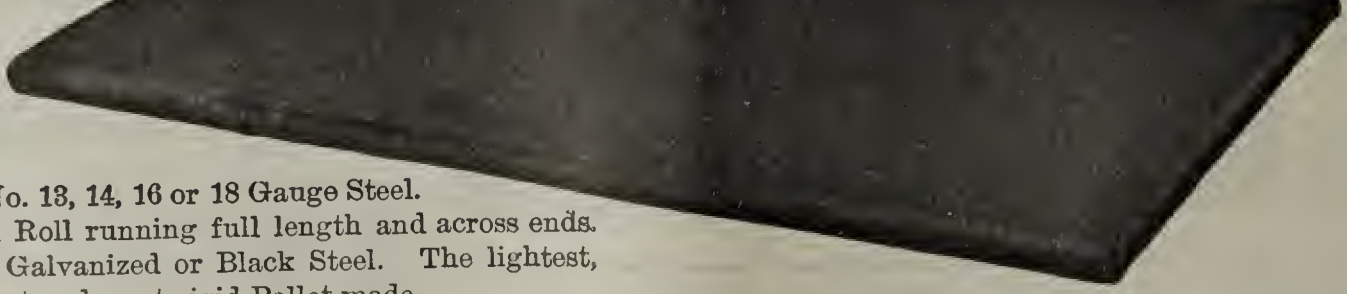
Write for detailed information

IMPROVED KILNS AND DRYERS
KILN FLOORS AND FURNACES

Brick & Clay Engineering Co.
(Inc.)
5116 Walnut St. Philadelphia, Pa.

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)



Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

HOTELS STATLER

BUFFALO—CLEVELAND
DETROIT
Hotel Statler, St. Louis, now building

Who's to Be Judge?

THERE would be small point to our guaranteeing you absolute satisfaction in a Hotel Statler unless we also agreed—as we do—that you are to be the judge.

We renew that guaranty and that understanding here. And we promise you, any time you come to us, more than your money's worth in comfortable, convenient hotel accommodations and service.

Every room has private bath, circulating ice-water, and many other unusual conveniences. Morning paper delivered free to all guest rooms. You get more for your money—unquestionably—at any Hotel Statler.

Rates from $1.50 Per Day

BUFFALO
450 Rooms
450 Baths

DETROIT
1000 Rooms
1000 Baths

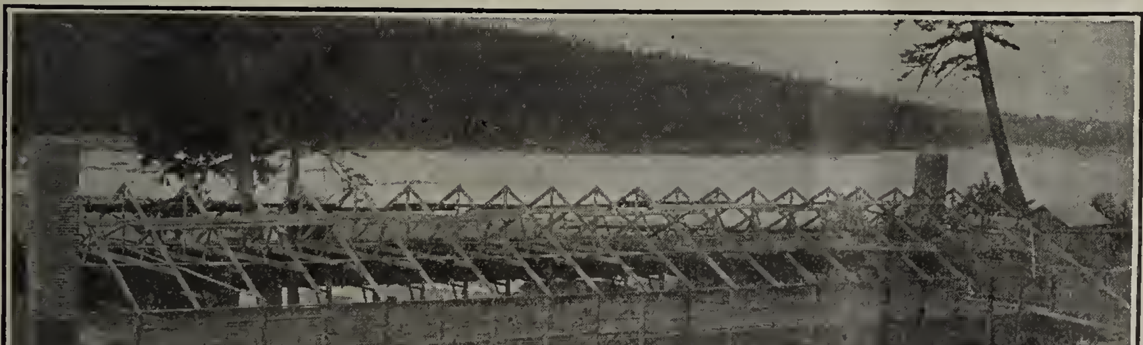
CLEVELAND
1000 Rooms
1000 Baths

The ROESSLER-HASSLACHER CHEMICAL COMPANY
100 William Street
NEW YORK

As a Preventative of Scums Use
CARBONATE OF BARYTES
R. & H. PRECIPITATED.

Oxide Tin,
Oxide Cobalt,
Red Oxide Iron,
Green Oxide Chrome,
White Oxide Antimony,
Black Oxide Manganese, and
all Chemicals used by the Clay Trades.

THE OREGON KILN



A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

ELLIS LOVEJOY

Consulting Engineer

COLUMBUS, OHIO

◆ ◆ ◆

Geological Examination of Properties

Clay Testing

Investigation of Manufacturing Propositions

Plants Designed, Construction Superintended and Operations Directed

Dryers, Furnaces, Kilns

Remodeling Old Plants Given Special Attention

Development of New Lines of Products

Appraisal of Plants

HOOK'S

LATEST IMPROVED SYSTEM

For Burning Clay Products
MEANS SUCCESS

Scores of Brick and Tile manufacturers in the United States and Canada are burning their ware successfully with

LATEST IMPROVED HOOK PATENT UP and DOWN DRAFT KILN

In one section of OHIO where this latest IMPROVED KILN is best known, one of our representatives took orders for over

20 KILNS IN 3 DAYS

This evidence certainly favors the installation of THE UP AND DOWN DRAFT SYSTEM

Do not be deceived, insist on having HOOK'S LATEST IMPROVED PATENT KILN.

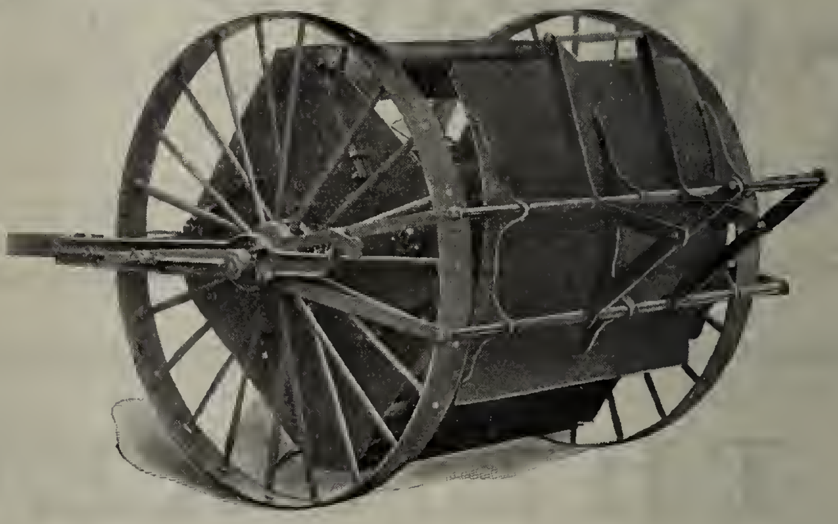
Sold only by

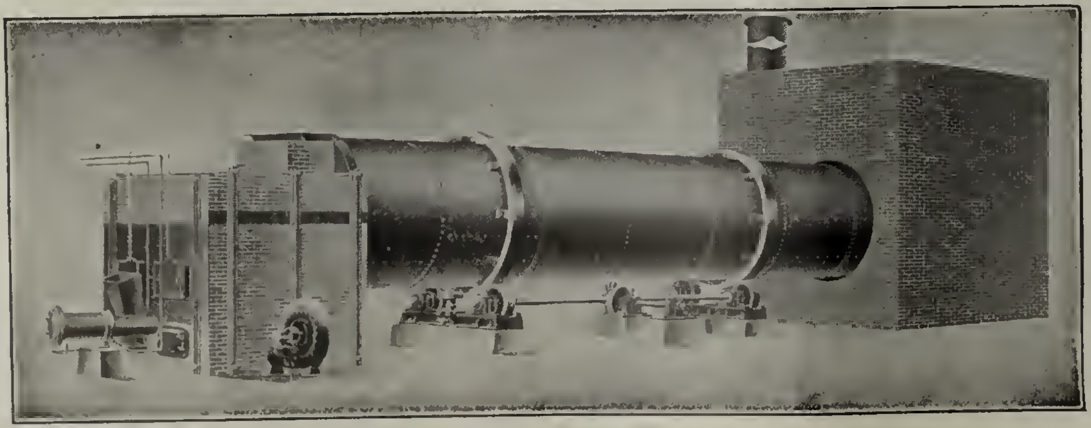
THE OHIO KILN CO.
VIGO, OHIO

THE QUINCY IMPROVED GATHERER

used in connection with our **SPECIAL CLAY PLOW** is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
Quincy, Ill.





ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
NEW YORK

MR. CLAYBURNER

If you reduce radiation from crown and walls of kiln you save time and fuel. If you increase life of linings and prevent rust and corrosion on dryer cars, fans, pipes, etc., you save costly renewals. You can do these things with Carbide Coating at a nominal cost.

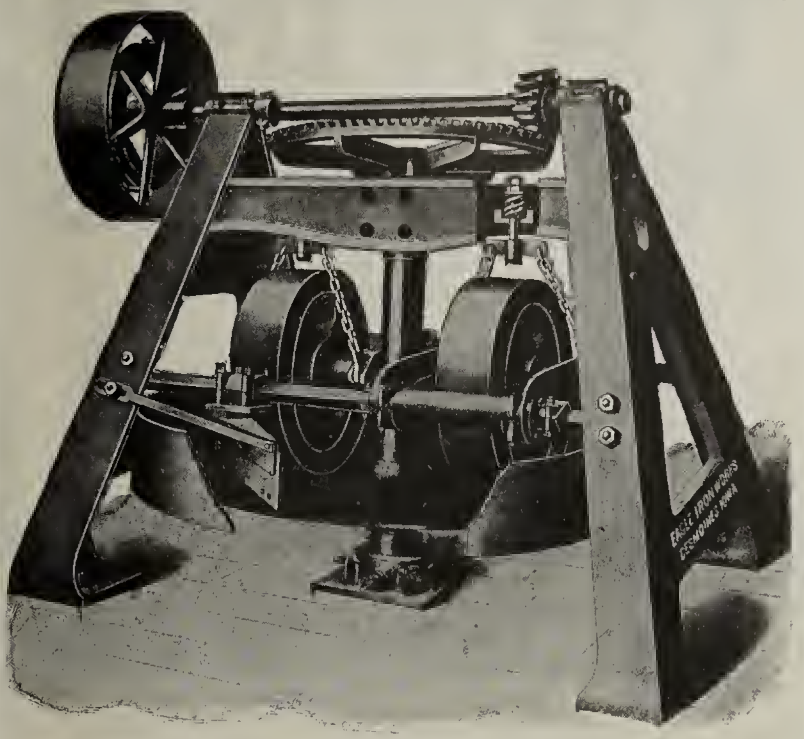
You may not believe that a coating or paint will protect linings. You, however, believe that salt glaze or a vitrified surface protects pipe and brick. Well, the pigment in Carbide Coating will endure heat that will burn up, vaporize fire brick and the vehicle or binder is the same article you get in salt glazing at the vitrifying temperature. The combination forms a composition which will protect linings, reduce radiation and protect metal from acid, sulphur and other corrosive fumes.

I will be very glad to show you how you can use this to advantage. Address,

E. R. STOWELL,
Oden, Mich.

Independent and Suspended Mullers

the distinguishing feature of our **DRY PANS**



Other valuable features which our catalogue fully describes.

EAGLE IRON WORKS
Des Moines, Iowa

DO YOU KNOW

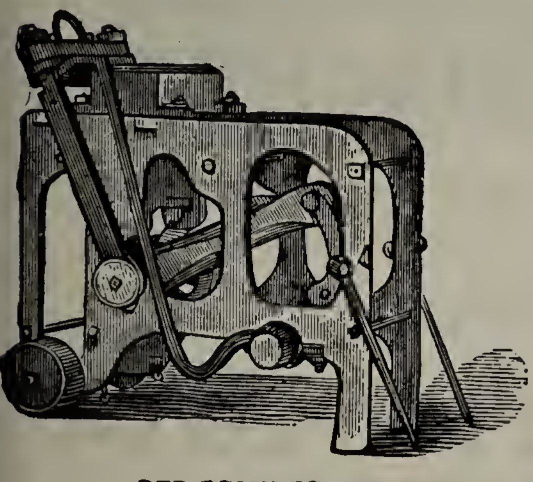
that in the BURNING OF BRICK a DRAFT GAGE is of greater advantage than a PYROMETER? We furnish both.

DO YOU KNOW

that for many years we have made the BEST DRAFT GAGES for all styles of kilns?

Write us for information of all kinds of controlling apparatus for clayworkers.

Ceramic Supply & Construction Co., Columbus, Ohio

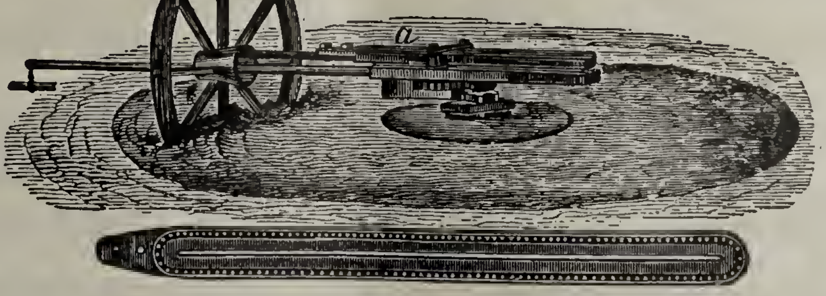


RED BRICK PRESS.

Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

"Nothing Succeeds Like Success"

THWING

HIGH RESISTANCE MULTIPLE RECORD

PYROMETERS

Have been placed in

EIGHT MORE
CERAMIC PLANTS

Since the Cleveland Convention

Are you interested?

Let us tell you about it.

Thwing Instrument Company
439 N. Fifth St.
PHILADELPHIA, PA.

The Three
Cardinal
Virtues in All
Brickmaking Equipment

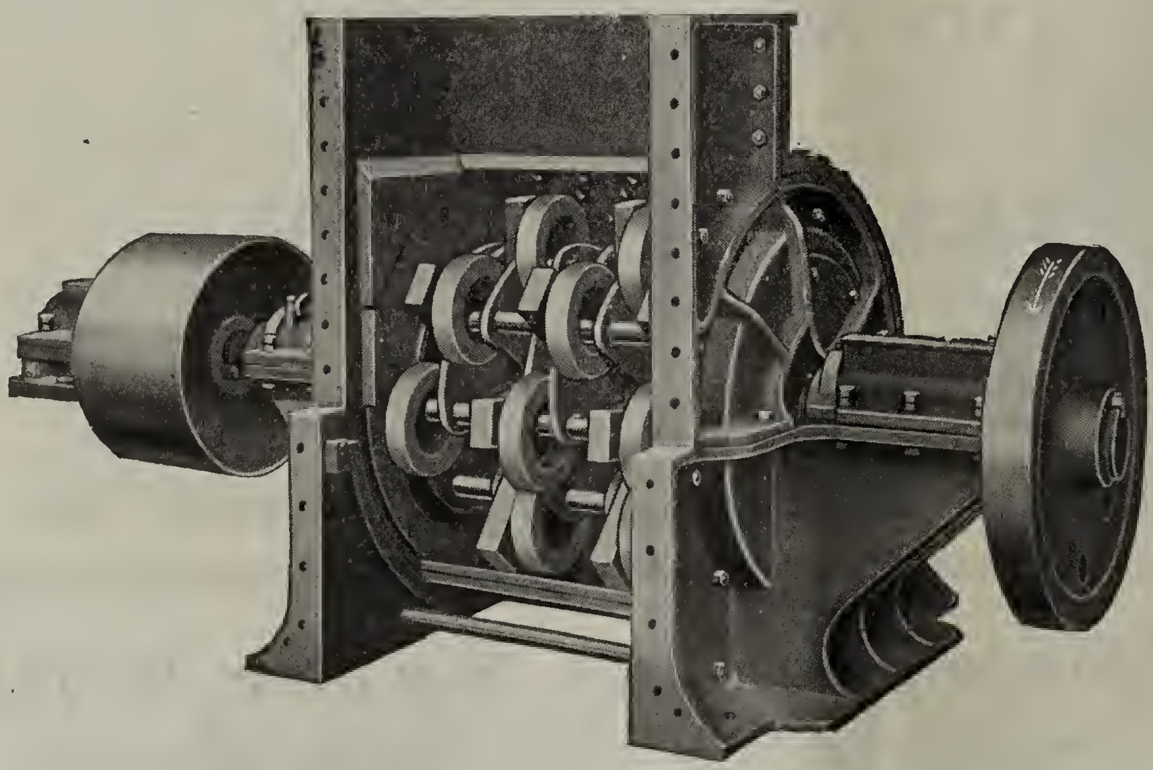
EFFICIENCY
ECONOMY
STABILITY

These you have in the highest degree in Brick Drying in

THE NATIONAL DRY KILN

INDIANAPOLIS, IND.

Write for Catalog,
mentioning The Clay-Worker.



The MACHINE that has POWER to PRODUCE

and will pulverize Shale or Shale and Clay, Brickbats, Coal, Coke, Marl, Kaolin, Sandstone, Burnt Lime, Fire Clay, etc.

Are You in Need of a

MACHINE

that can pulverize **18 to 25 Tons of Shale and Clay per hour** and save 50 per cent installation cost.

Describe your material, ask for catalog, and information.

GEO. C. VIDETTO
Eastern Sales Manager
207 Fulton Building, Pittsburg, Pa.

American Pulverizer Co.
EAST ST. LOUIS, ILLINOIS

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

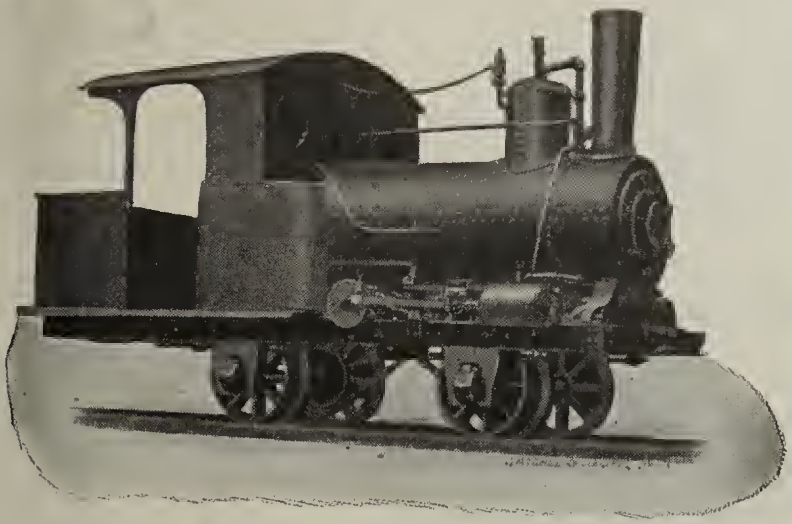
We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

1,653,000 Cubic Yards in 24 Years

Clay for 264,000,000 Brick in 9 Years with Type O Thew.

Clay for 397,500,000 Brick in 15 Years with Type 3 Thew.

Clay for 31,000,000 Brick in 1916 with Type I Thew and but half a day's delay during the year.

Twenty-four years of service and still operating and the owner writes: "The shovel is not very handsome to look at but it does its work without any trouble. We can't say anything too good for the shovel or for The THEW COMPANY."

Over 300 Brick Manufacturers own THEW SHOVELS and will bear similar testimony.

239 Thew owners have given repeat orders.

In the face of such testimony, can you afford to employ old methods and have your output reduced by inability to get men enough in the clay pit to keep your plant running to capacity?

A Thew shovel would save you time, money and trouble, increase the output of your plant and improve the quality of your product.

Circular 22-F shows you why and gives valuable data. It is yours for the asking.

INVESTIGATE THE THEW. IT PAYS.

The THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

JOIN THE

BOOST **BUILD WITH BRICK** **BOOST**

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles; structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

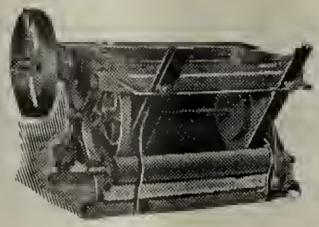
name ....

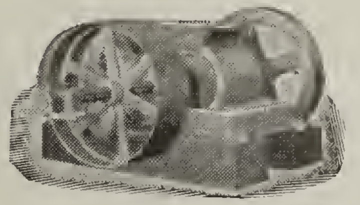
....

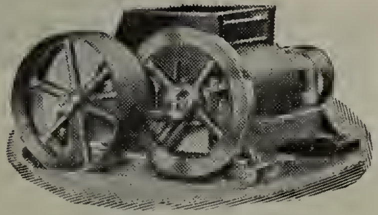
(Cross out the items not wanted, fill in and mail us the coupon.)

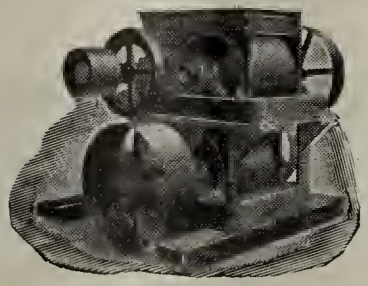
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

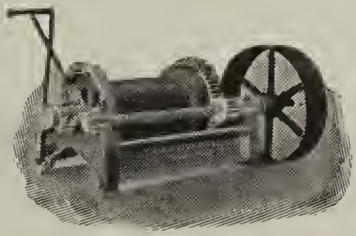
Vertical Brick Machine

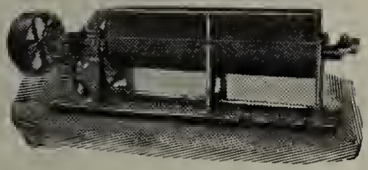

Style "A" Mould Sander

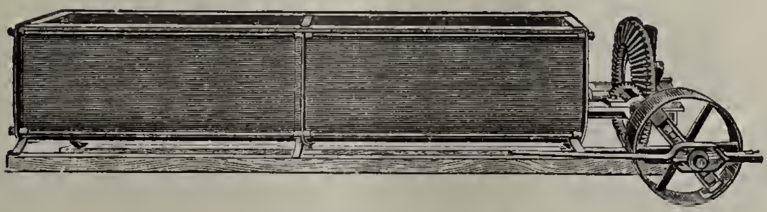

Style "P" Roller-Crusher

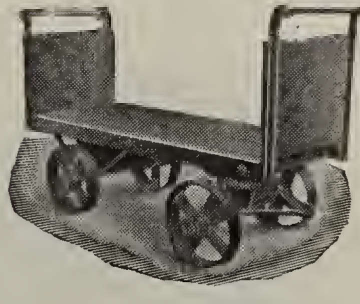

Style "A" and "P" Disintegrator

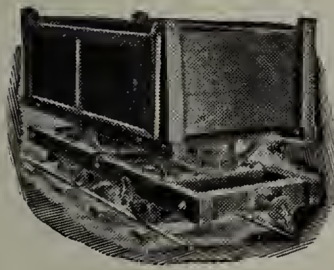

Style "P" Compound Disintegrator and Crusher


Style "B" Winding Drum

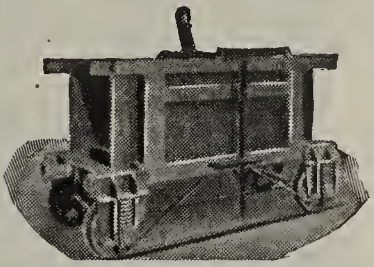

Double Geared Pug Mill

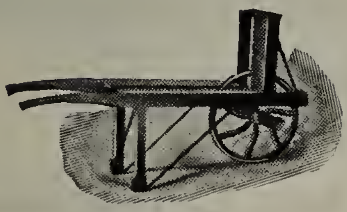

Single Geared Pug Mill


Mule Truck

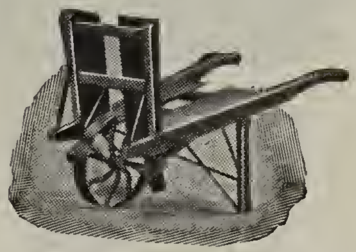

Side Dump Car

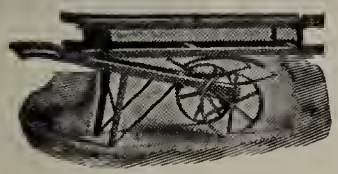
Feeder or Granulator

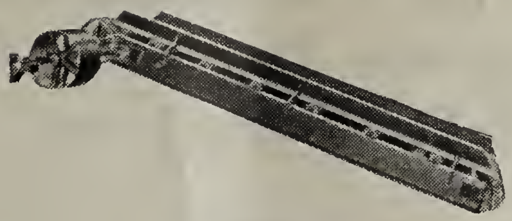

Bottom Dump Car


No. 6 Barrow

The Potts Rocker Grate
For any size fire box
on boiler or kilns


No. 2 Barrow


Double Deck Truck


Clay Elevator.

Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for Prices.

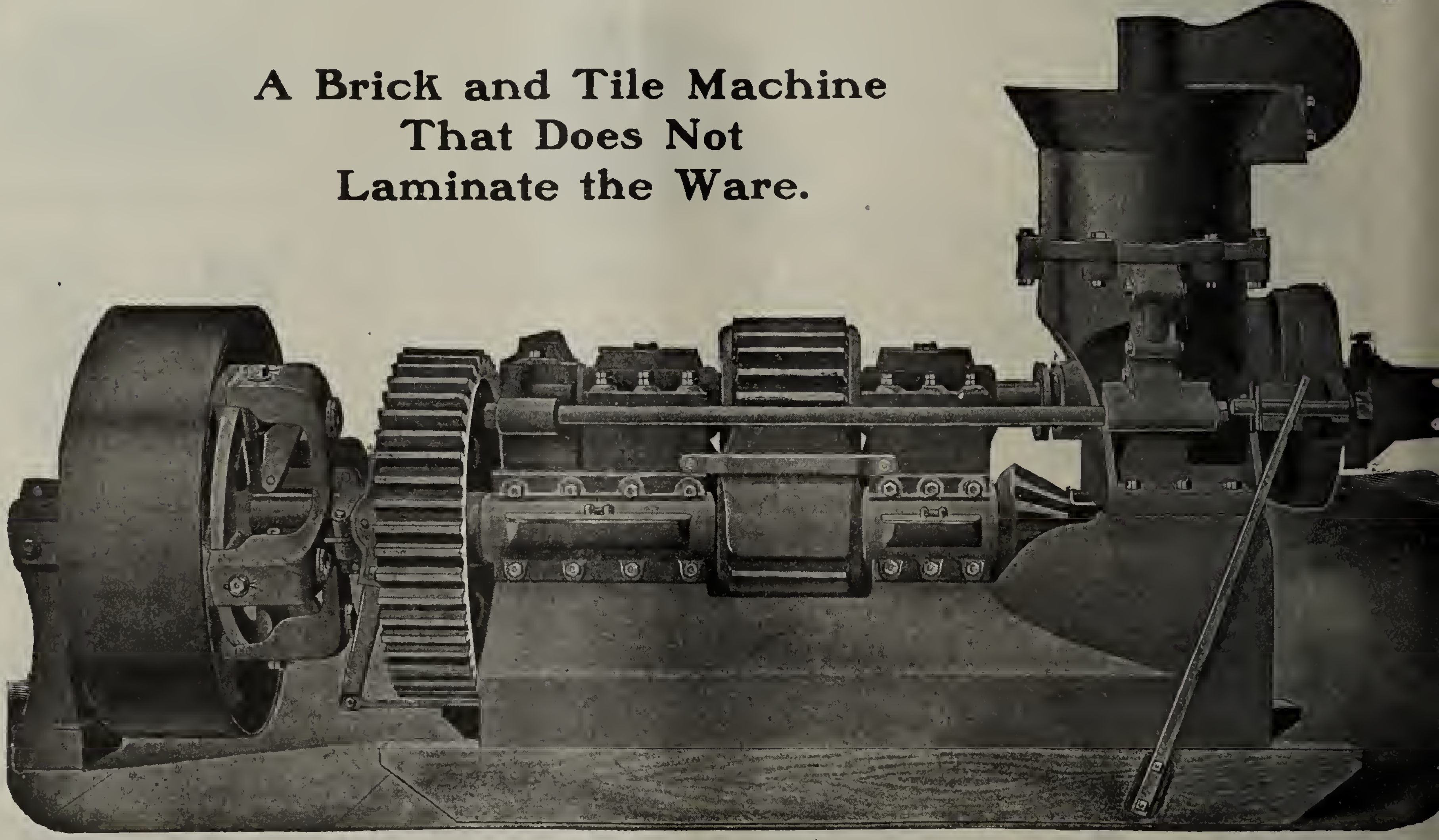
If it's to be Had We Have it.

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

A Brick and Tile Machine
That Does Not
Laminate the Ware.



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

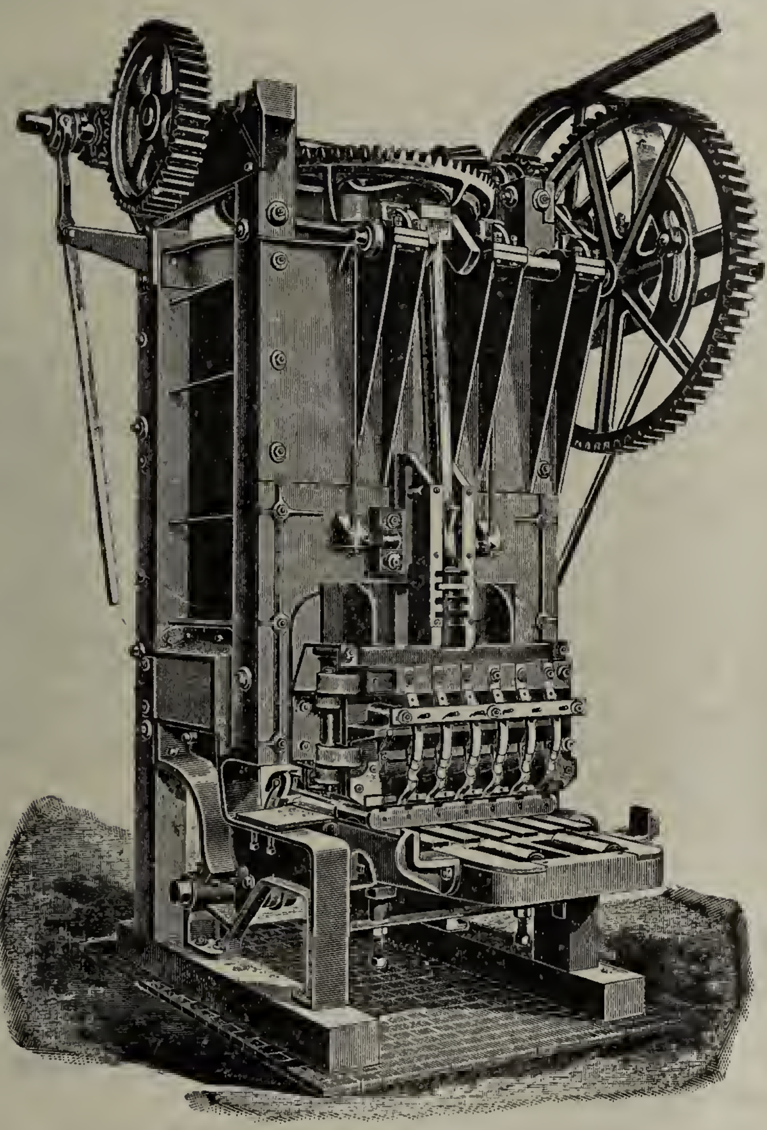
THE WALLACE MFG. CO.

FRANKFORT, IND.

SPEED and ENDURANCE

Combined to Make a New Record for "New Haven" Machines.

The following letter from an enthusiastic user of a "New Haven" Soft Mud Brick Machine tells the story of how a New York brickmaker set a new record for soft mud machines.



"New Haven" Vertical Brick Machine

RICHMOND BRICK CO.
Greenridge, S. I., N. Y.,

The Eastern Machinery Co.,
New Haven, Conn.

Gentlemen—On Saturday, May 17th, we made 95 M bricks with our New Haven Soft Mud Machine. We started out in the morning with the intention of making 100 M brick in ten hours with one machine, but at 95 M we ran out of cars. We turned out the 95 M brick in 9 hours 27 minutes, actual running time. This, no doubt, is a world's record for one soft mud machine. We can repeat this performance any day in the week. It is just a matter of taking the bricks away from the machine as fast as it will make them.

Yours very truly,
Richmond Brick Co.
C. Steadman, Supt.

Any brickmaker can equal this record on a "New Haven," for all our machines are built to stand tests of Speed and Endurance every day in the year.

The EASTERN MACHINERY CO.
NEW HAVEN, CONN.

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Land Drainage, by J. L. Parsons. Price, $1.50.

A treatise on the design and construction of open and closed drains.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

Drying Brick, by W. D. Richardson. Price 25 Cents.

A little booklet giving and explaining the various styles of dryers, etc.

T. A. RANDALL & CO.

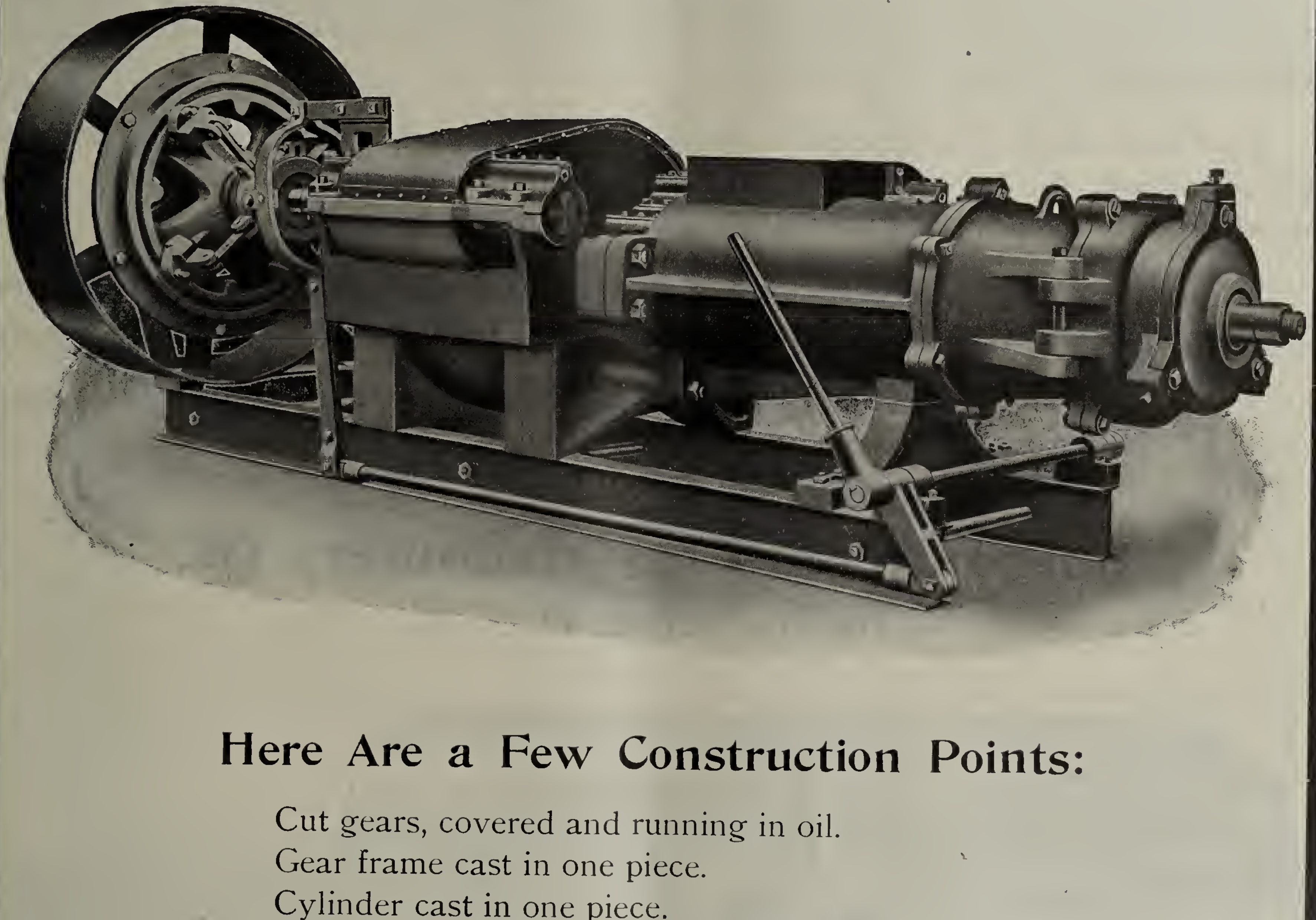
Indianapolis, Ind., U. S. A.

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

The Brewer No. 88 Horizontal

DRAIN TILE MACHINE

A high grade, high speed, heavy duty pattern, new enough to be up to the minute, but old enough to have shown what it can do.



Here Are a Few Construction Points:

Cut gears, covered and running in oil.
Gear frame cast in one piece.
Cylinder cast in one piece.
Hammered steel shafts. Self-oiling bearings.
Sectional lined screw case. Heavy 29-in. disc clutch.
Tool steel bushed dies.

Ask for complete catalog, references and prices.

H. BREWER & COMPANY, Tecumseh, Mich.

**HERE IS
A
KILN
THAT WILL
DO AWAY
WITH
YOUR
KILN LOSSES**

The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

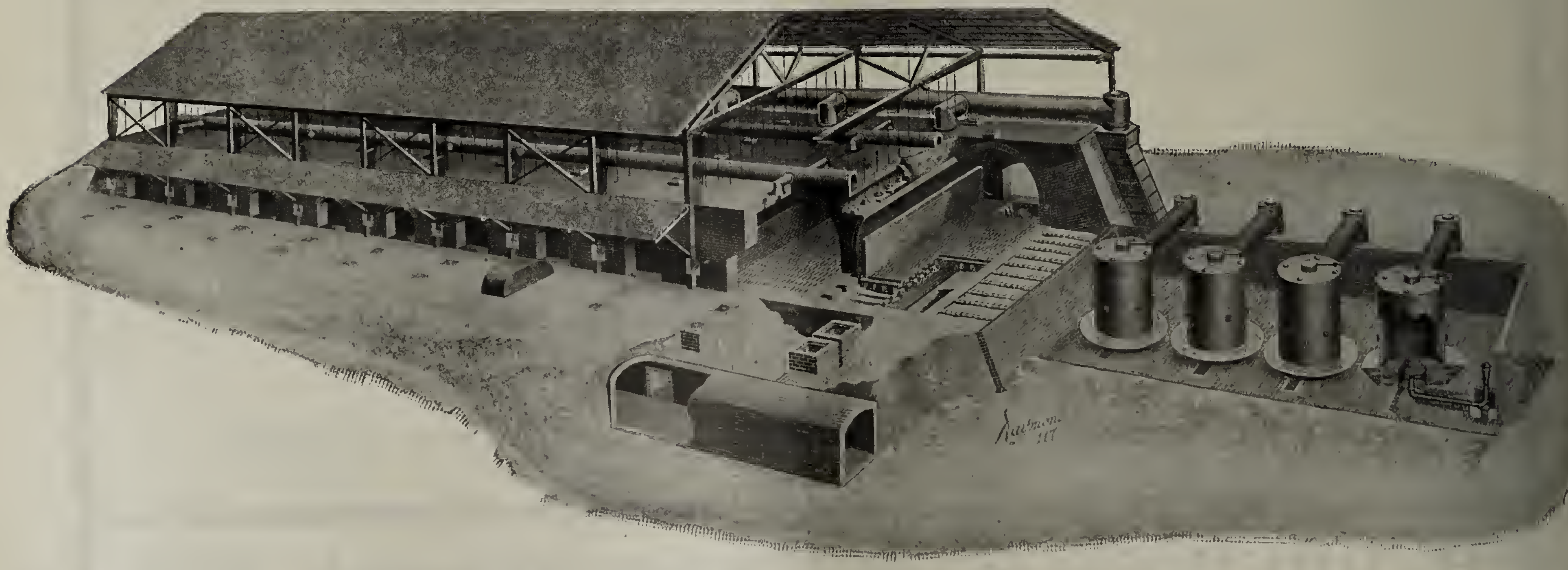
That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

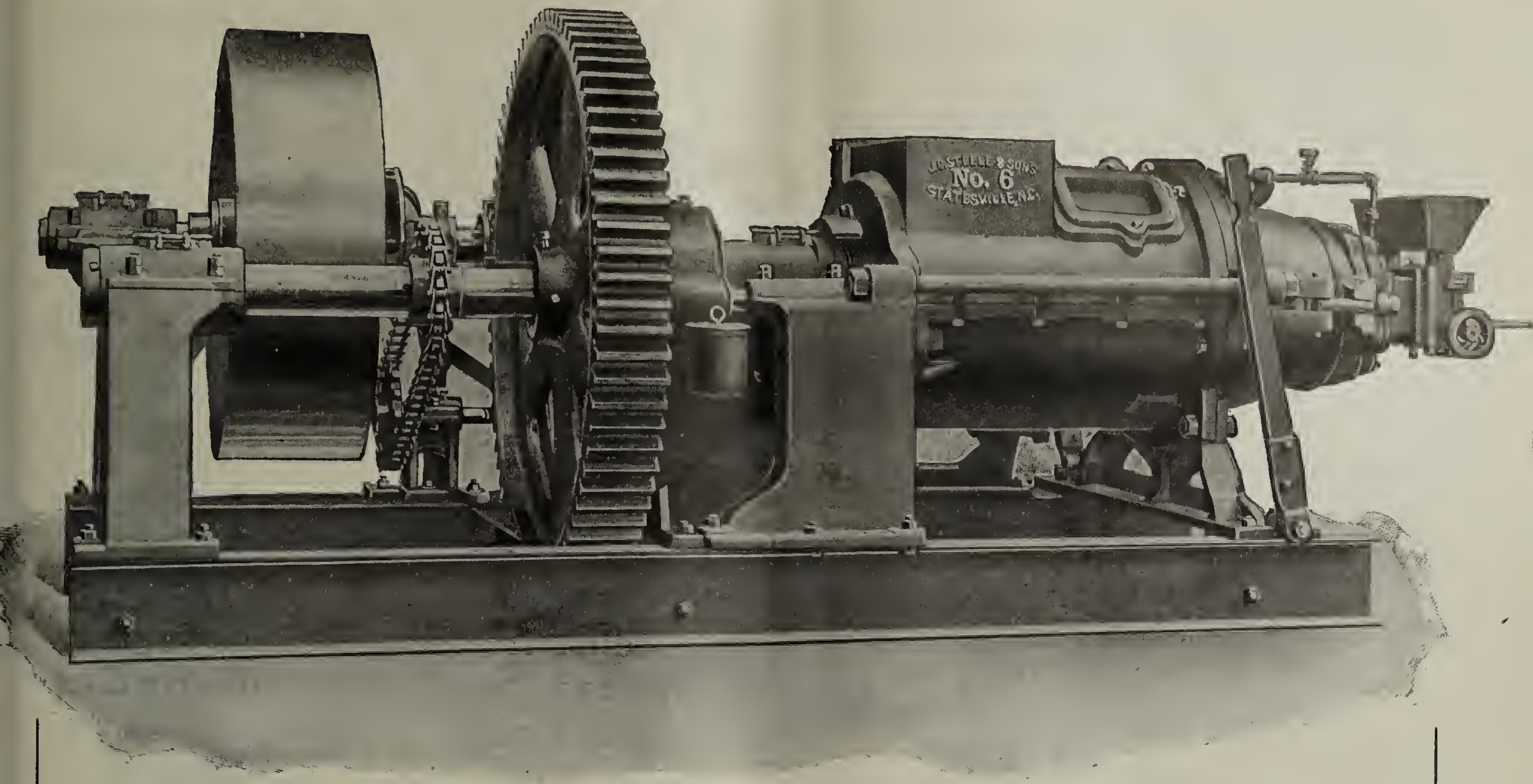
A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

International Clay Machinery Co.

Dayton, Ohio, U. S. A.



The Producer Gas Fired Continuous Kiln



(HOUSING REMOVED)

No. 6 Brick Machine, Capacity 50,000 to 150,000

A brick machine of largest capacity with single gear driving mechanism of new and improved design.

Tested for hours at a speed of 45 revolutions per minute of the auger shaft. Remember, engine speed and auger shaft speed are fixed speeds, and the less transmitting appliances between them, the less power required.

This machine has only two gears and four bearings—a reduction of three bearings, two gears and one shaft, as compared with most machines of large size.

The bearings are very large—from 4½ in. x 15 in. to 9 in. x 18 in.

The friction clutch pulley runs loose on a 7⅝ in. x 18 in. bearing.

The gear is very large, thereby reducing tooth load and side strain on bearings to a minimum; therefore reducing power required, wear and tear to a minimum.

Gears are cut, pinion being steel. Housed and run in oil bath.

Thrust bearing of most approved design, in front of gear; less than half frame. Outer end of auger shaft supported on out-board stand, thereby getting distance between bearings, and again reducing side strain and friction.

Sills are very heavy "I" beams with heavy channel for side strain.

Machine can be taken to pieces without elevating any part; will run equally well in either direction.

Cutter driving mechanism entirely separated from more important wearing parts, and get any speed in either direction.

Standard auger shaft for brick made of steel, 9½ in. in diameter, with inserted adjustable steel knives, and renewable wearing surface or shell. Also equipped with a system of continuous augers and bushings, telescoping mouthpiece, etc., for any kind of hollow ware. In this case, the shell is left off and knives fit over shaft.

A close examination will reveal many interesting points that we have not space to mention.

For further information address

J. C. STEELE & SONS

STATESVILLE, N. C.

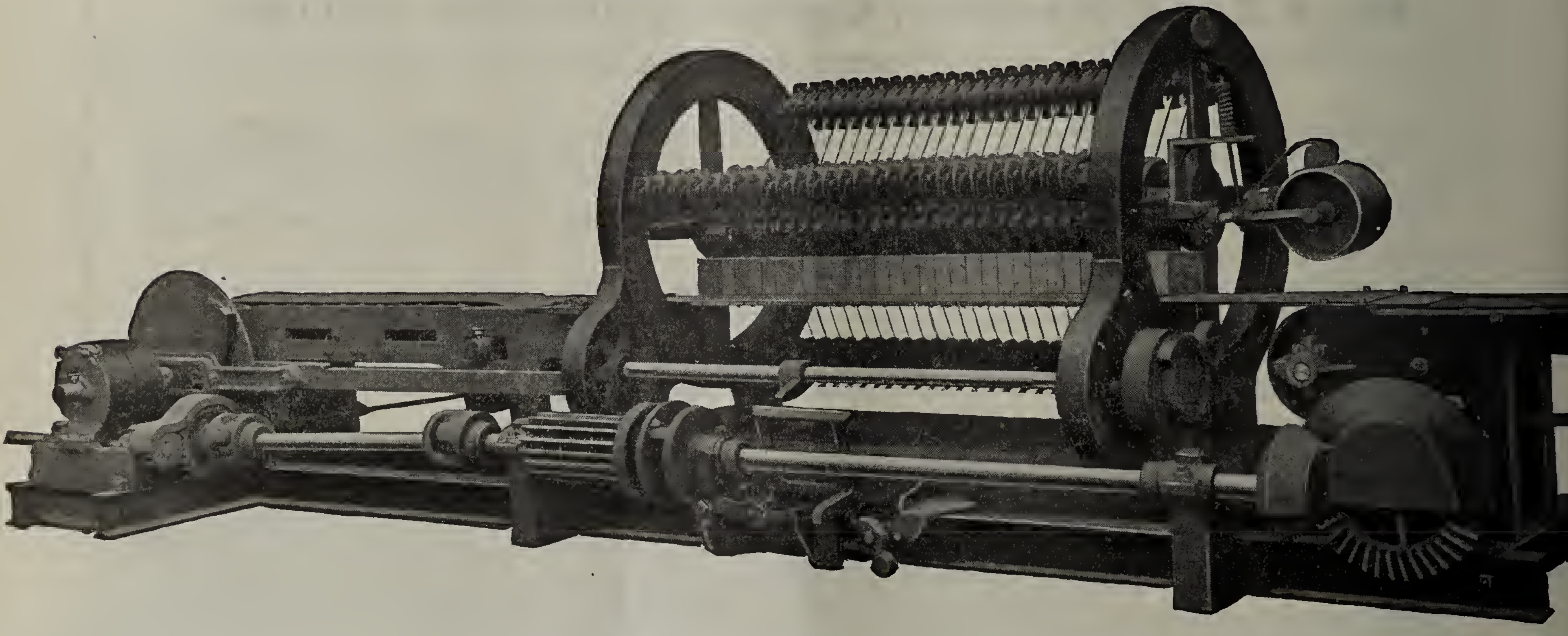
Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

Automat
OR
Acrobat?

Positive clutch, mechanically controlled carriage movement, no segment gears or slipping belts—**An Automatic Cutter.**

Slipping belts, friction clutches, segment gears, slipping parts—**An Acrobatic Cutter.**

Which is most satisfactory—NATURALLY?



Model C 30 Rotating Automatic Cutter

A postitive sure-acting automatic cutter giving perfect satisfaction in several hundred plants.

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For
Sixty-Three
Years
The Name

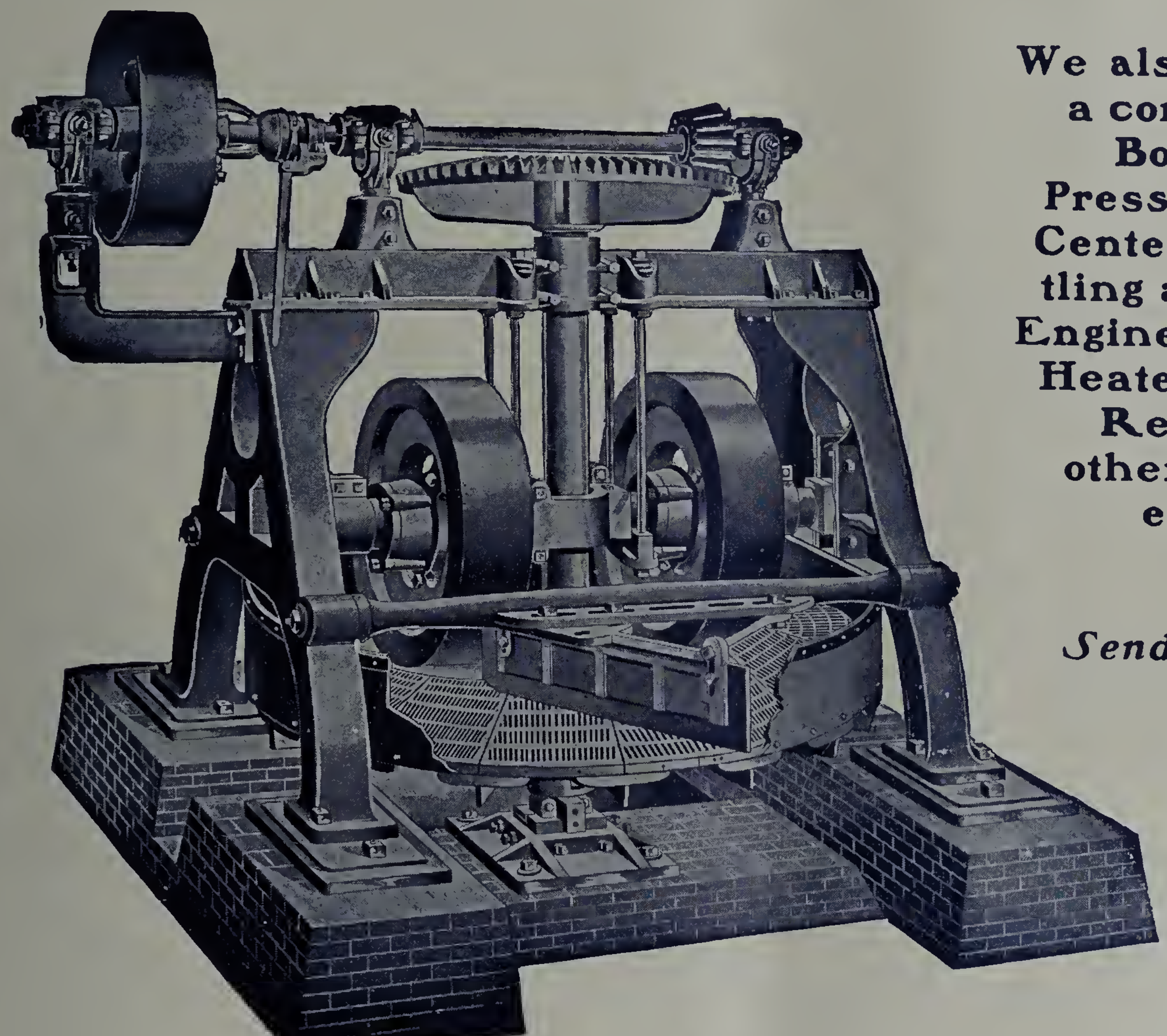
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



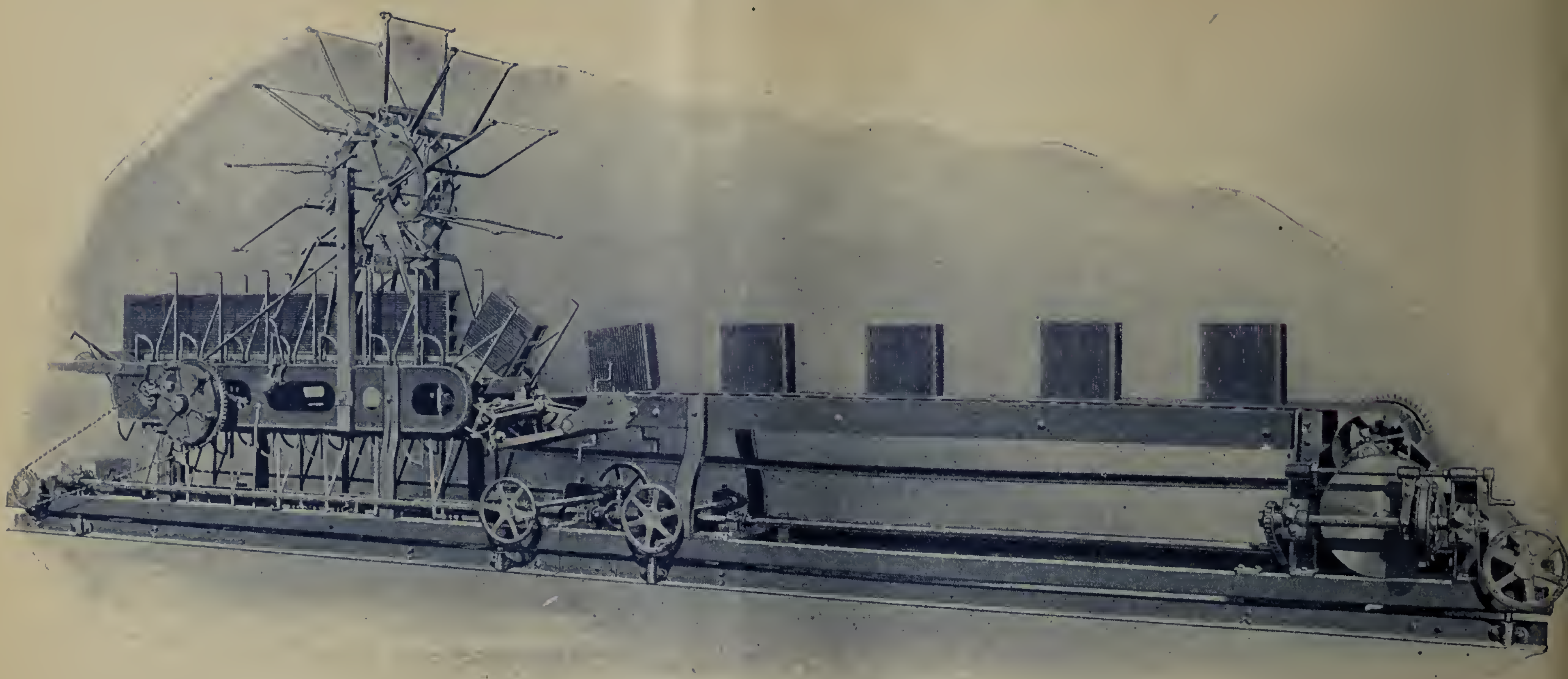
We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO." Chicago.



The Wise Man of FATE

Here is the New Device Fate Was to Announce

This new machine is Type "D" Cutter with Automatic Delivery for Hollow Ware which revolutionizes the production of this product by automatically doing what men have been doing by hand, and by turning out a greatly improved block at less cost.

It automatically cuts hollow block of all sizes up to and including 14 by 14 inches, and delivers the block on end to the off-bearing belt. It reduces labor cost by eliminating the man who, usually, has to stand guard at the delivery end of the cutter and act as an off-bearer. It reduces waste at the delivery end of the cutter because the blocks are delivered onto the off-bearing belt on end, which permits safer and surer handling.

The Fate Type "D" Cutter

With Automatic Delivery for Hollow Ware

This Cutter and the off-bearing belt have the Fate friction drive transmission, which gives an unlimited speed ratio to both the cutter and the off-bearing belt.

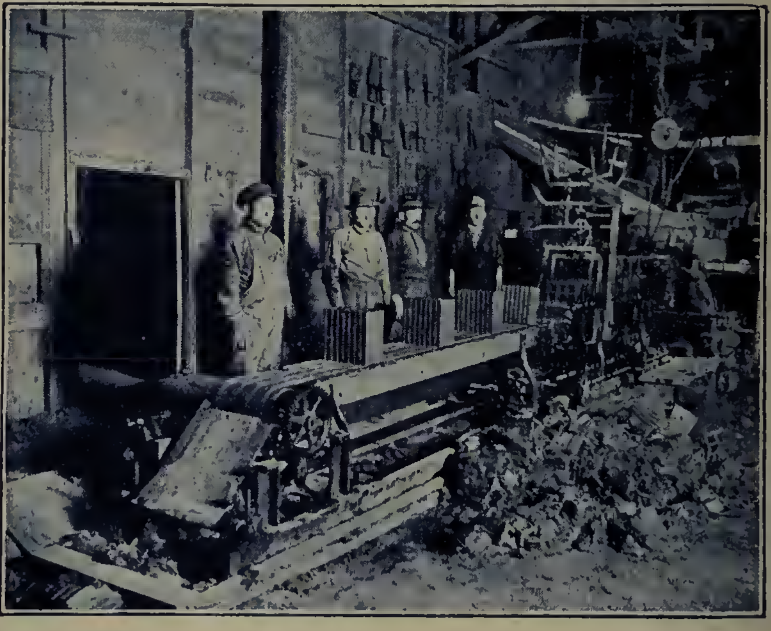
The Type D Cutter has disappearing cams at the end of the table, which elevate boards, or shelves, that support the cut blocks as the table inclines, and holds them until they reach the off-bearing belt, which automatically takes them away from the table.

The Cutter and off-bearing belt are both mounted on angle iron frames. A crank and screw arrangement is provided, which allows the adjustment of both the cutter and off-bearing belt to the different sizes of block.

The Troy Fireproofing Co. Gives New Device Hard Test

One of these Type "D" machines has been in use in the plant of the Troy Fireproofing Co., Troy, N. Y., under the direct supervision of Manager Hutton. The clay is of such a soft nature that, prior to the installation of this machine, it was difficult to produce the ware with economy and efficiency because of the great amount of waste. A heap of this waste is shown in the picture at the right, which also shows the new machine at work.

The test was the most severe that could be given and the new device has proved its worth under all conditions. With such a record this machine will solve your problem.



GET FACTS

For full particulars about the new Type "D" machine or any of the other Fate machines, check off the list in the coupon and mail it to us today.

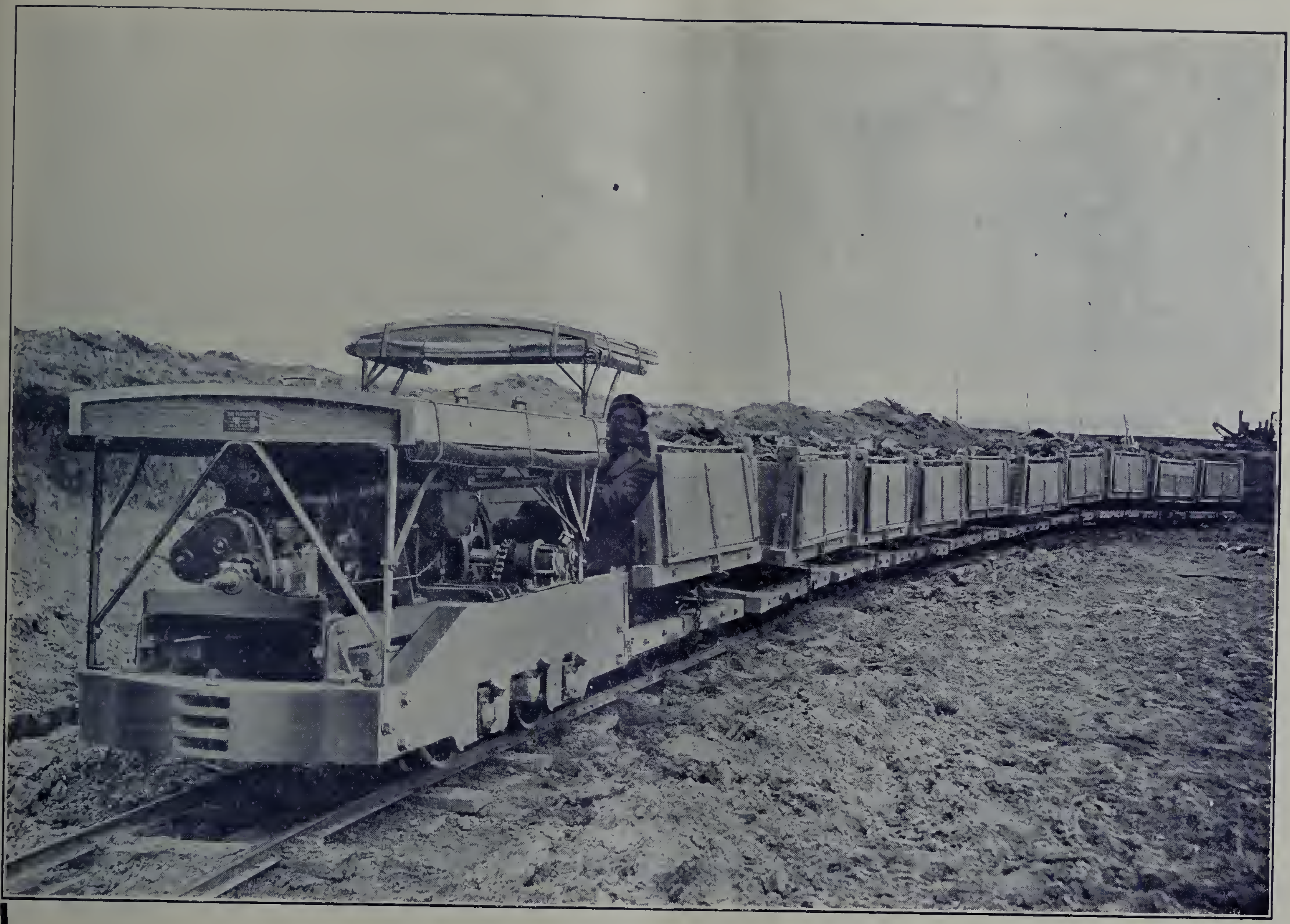
The J. D. Fate Co., 242 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

☐ Auger Brick Machinery.
☐ Hollow Ware Machinery.
☐ Conveyors.
☐ Crushers.
☐ Elevators.
☐ Clay Feeders.
☐ Disintegrators.
☐ Pug Mills.
☐ Clay Testing.
☐ Full Equipment.
☐ Industrial Locomotives.
☐ Drain Tile Machinery.

Name ....

Town.................................. State...........

THE J. D. FATE CO., 242 Riggs Ave., PLYMOUTH, O.



Biglow Does His Haulage Cheaper

E. Biglow Co., New London, Ohio, has had a "Plymouth" Gasoline Locomotive in its clay plant for more than a year, "The Plymouth" replacing another make of gasoline locomotive.

Biglow says he is not only getting more WORK and BETTER work, but that he is getting it done much cheaper

With

"The Plymouth"

Gasoline Locomotive

Mr. Biglow's experience is worth knowing—if you do hauling. Read what he says about "The Plymouth," and let it set YOU to thinking.

"We are not only doing more work, but better work with 'The Plymouth' than we did with our other gasoline locomotive and it is costing us less for fuel, less for labor and less for repairs—our repairs having been practically nothing in the year we have used 'The Plymouth.' We consume about five gallons of gasoline per day and 3-4 pts. lubricants. We consider the friction drive on 'The Plymouth' far superior to the old gear-driven transmission. There is nothing to wear out except the fibre rim, and we have used one of these four years. 'The Plymouth' is the best investment we have in our yards."

GET BOOK OF FACTS

We have a big Book of Facts that tells all about "The Plymouth" and you ought to have a copy—it's free. It has pictures of "Plymouth" installations with actual records of each case, and some of these "Plymouths" are doing work identical with YOURS. Send TODAY for this FREE Book of Facts.

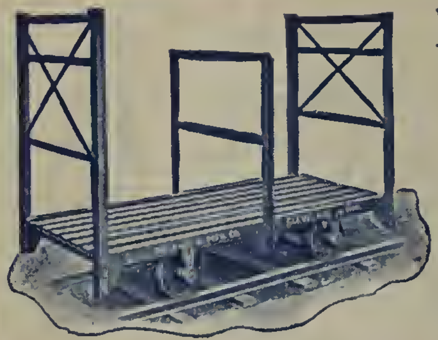
THE J. D. FATE CO., 242 Riggs Ave., PLYMOUTH, O.

The J.
D. Fate
Company
242 Riggs Ave.
Plymouth, Ohio.

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

(Firm Name)..................
(City) ....
(Street) ....
(State) ....

Mention The Clay-Worker.

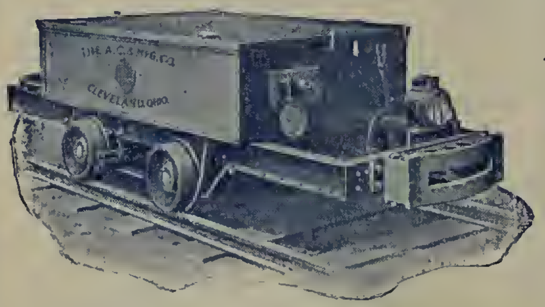


No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives



Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

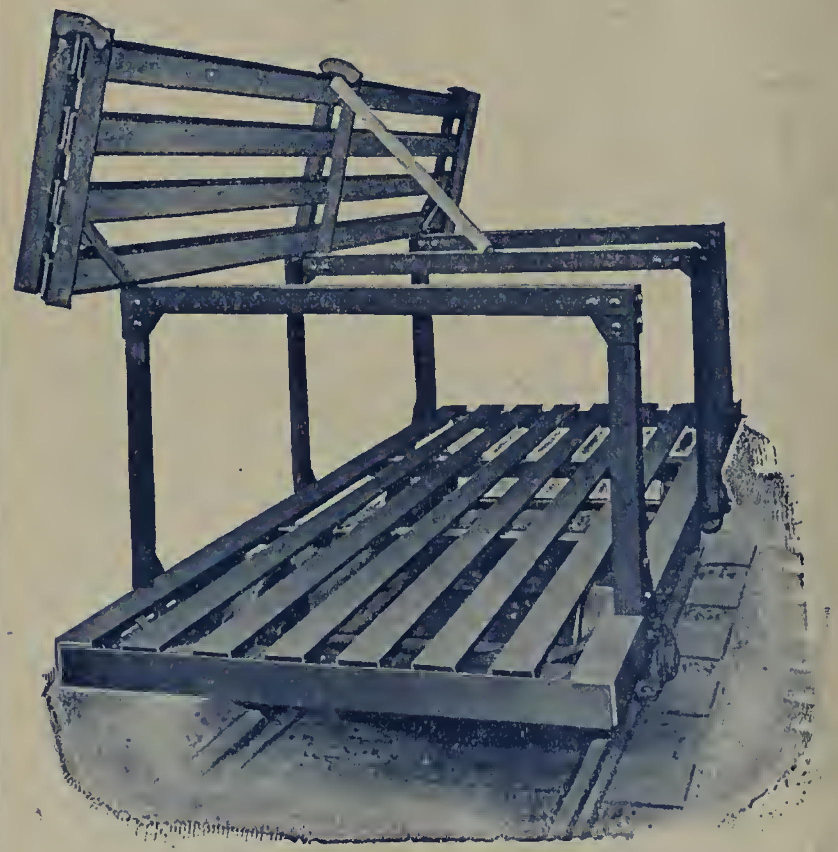
THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information

Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

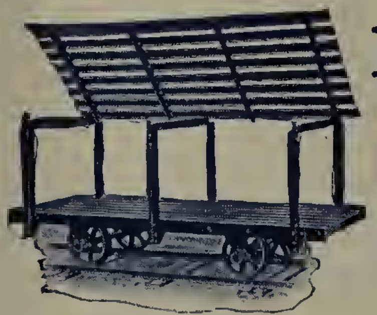


With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"



LAKEWOOD NO. 166

Dryer Cars
Rack Cars
Dump Cars

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

Chicago: 506 S. Canal St.
Pittsburgh: 1230 Fulton Bldg.
New York: 30 Church St., Room 802.
Baltimore: Munsey Bldg.
Kansas City: N. Y. Life Bldg.

JULY, 1916

THE CLAY-WORKER

Constructing the First Brick Paved State Aid Road in Madison Co., Ill. See page 22.

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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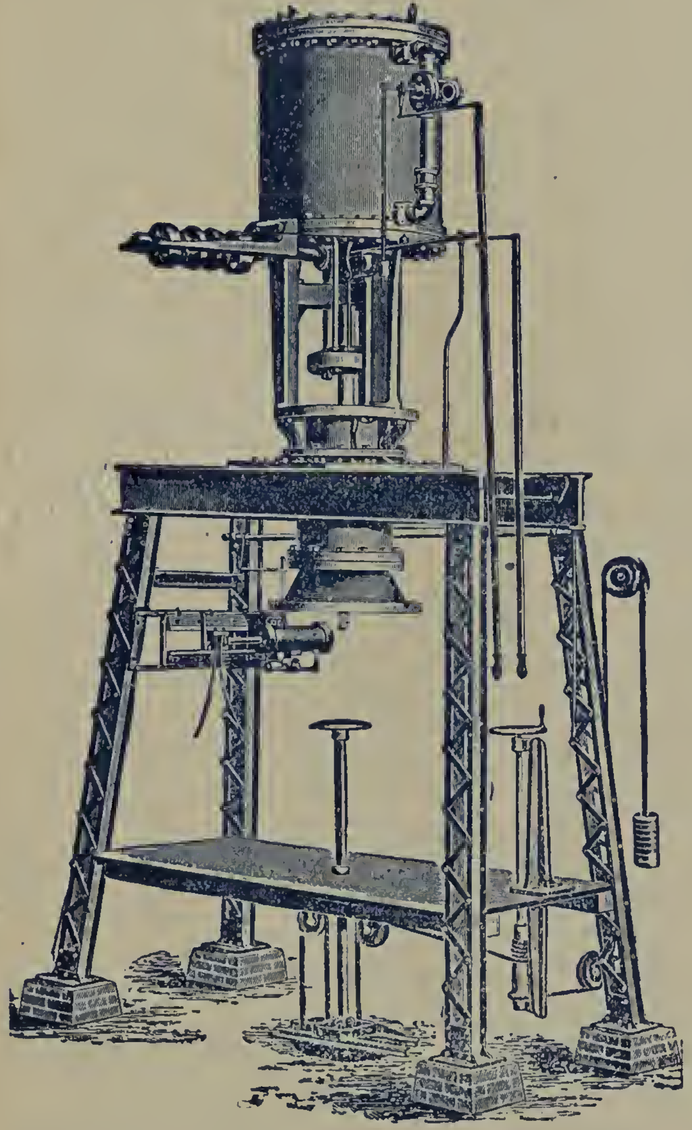
UNIVERSITY OF ILLINOIS

All men get stung sometime. Some men get stung all the time, except the ones who buy PIONEER CLAYWORKING MACHINERY.

ASK FOR THE PIONEER BRAND, made by THE TAPLIN, RICE-CLERKIN CO., of Akron, Ohio. THAT MEANS SOMETHING SPECIFIC. Means a line of goods that has been well and favorably known to the Clayworking Industry for the past forty years.



We had no competitors at that time—because we were the BEGINNERS; and every step in development and improvement of Clayworking Machinery has been done by Our Company. WE BLAZE THE WAY.

Every up-to-date Sewer Pipe Plant from Maine to California; from the Lakes to the Gulf; from Vancouver to Halifax; from El Paso to Mexico City—is equipped with our machinery.

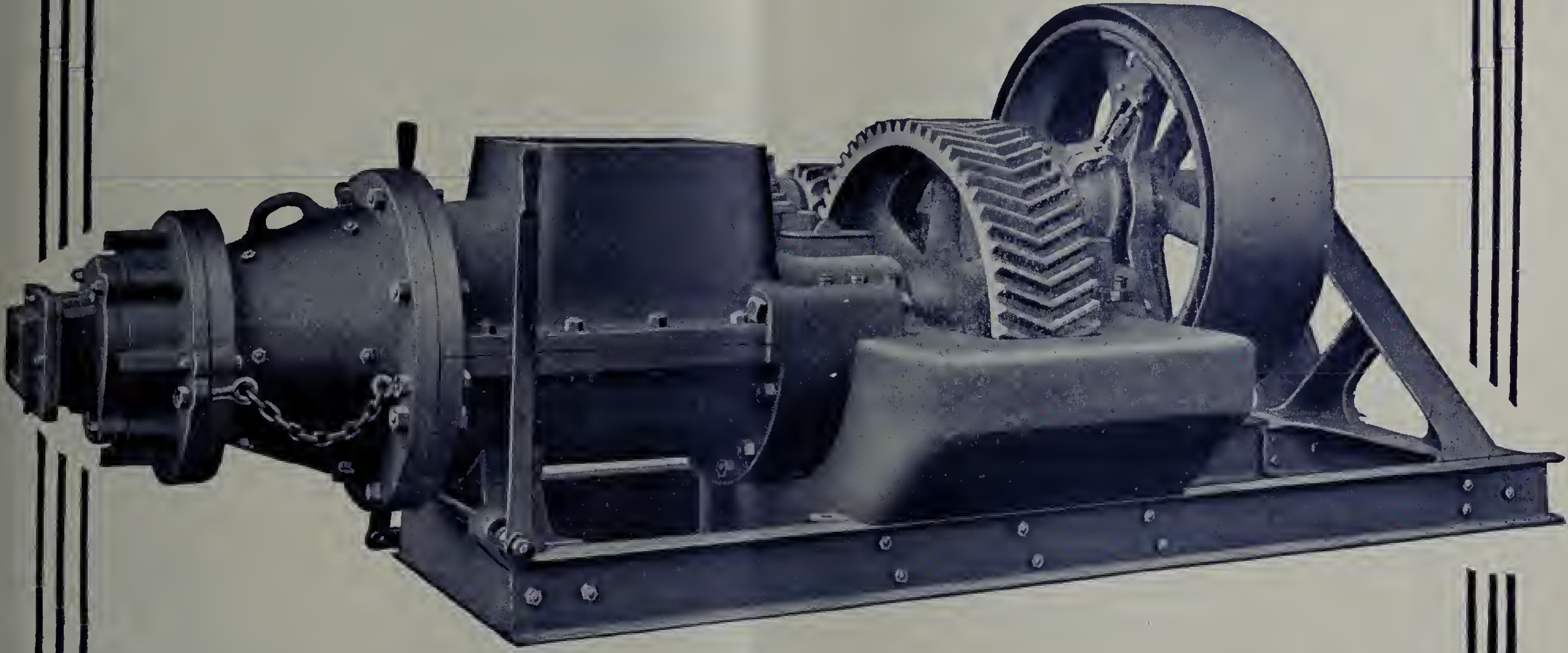
This business was not obtained on PRICE, but ON MERIT and well known, proved results.

Our catalog No. 29 tells about it. The balance is told by 125 different, well-satisfied users, in the territory above described.

THE TAPLIN, RICE-CLERKIN CO.

Akron, Ohio

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



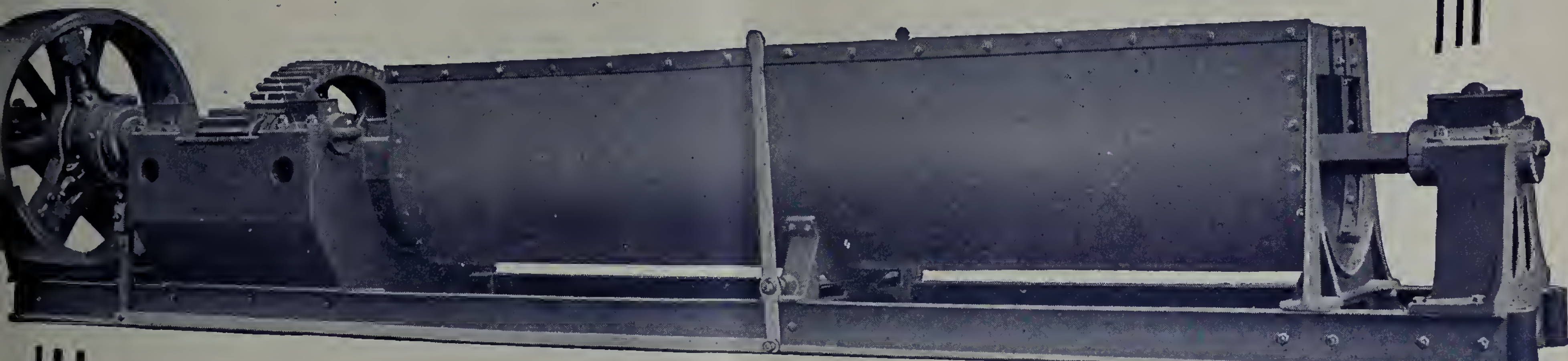
THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.



THE BONNOT COMPANY

CANTON, OHIO

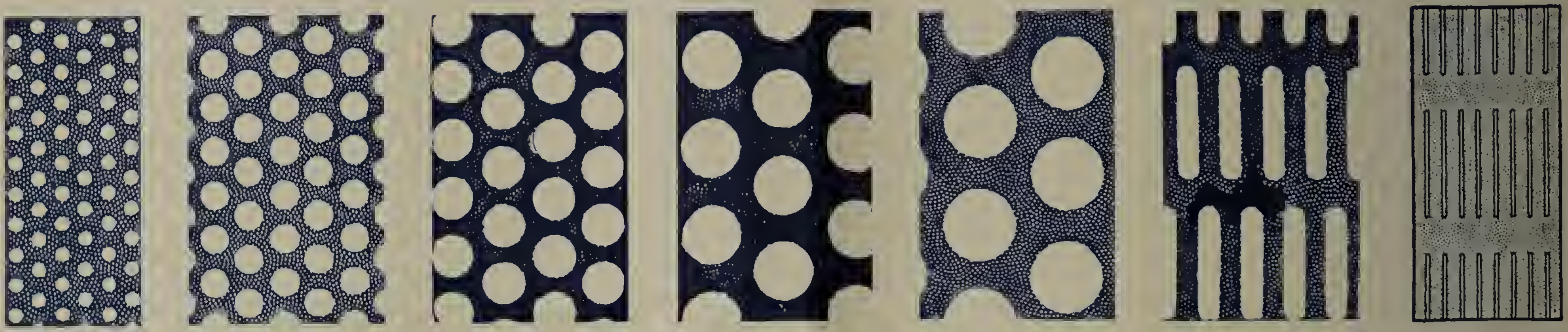
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

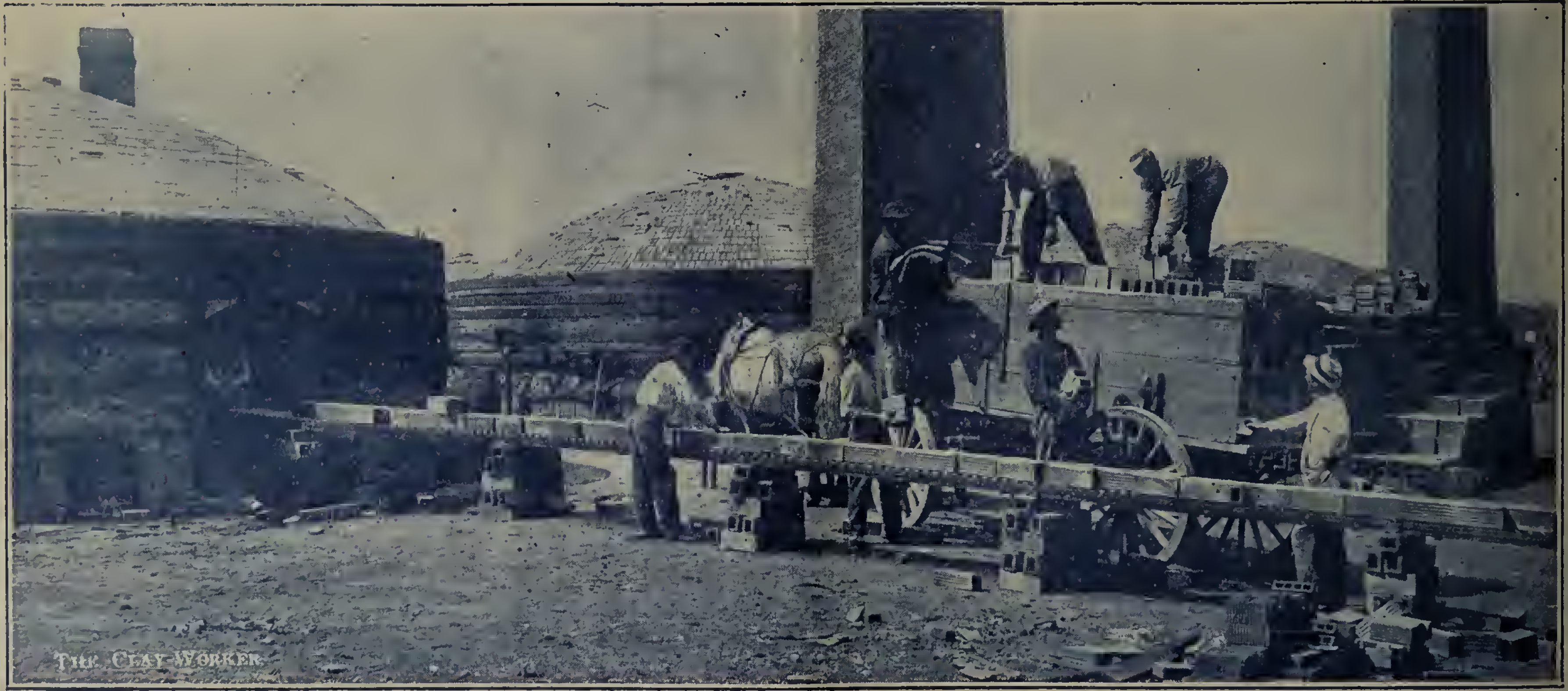
The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

Prepare for a Busy Season and a Labor Famine!

Make Yourself Independent of Your Wheeling Gang When the Rush Comes.



BARKWILL BRICK CO. PLANT, CLEVELAND, OHIO, SHOWING THE MATHEWS GRAVITY BRICK CONVEYER.

Don't wait until you are in trouble before you order an outfit of Mathews Gravity Conveyers. You cannot expect us to have a system to fit your requirements all made up ready to ship the day you order it, no matter how badly you need it. We always have orders ahead of yours, and we need time—sometimes several weeks—to catch up with an accumulation of unfilled orders. Ask us now to send the nearest representative. He will tell you what you need, the cost, and get the order on file without waste of valuable time.

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LONDON, ENG.

MATHEWS GRAVITY CARRIER CO.
ELLWOOD CITY, PA.

RODGERS

RODGERS FOR DRYERS

The Best is None too Good

for Clay Product buyers of today.

Manufacturers are vying with one another to gain their attention and patronage. A "GOOD ENOUGH" product doesn't "GO" these days. The man who would "MAKE GOOD" MUST MAKE GOOD GOODS.

Many men of many minds
Dry
Many clays of many kinds
in

RODGERS WASTE HEAT DRYERS.

L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
Brick Works Engineers

Largest Manufacturers of Brick Drying Equipment in the United States

General Offices and Works

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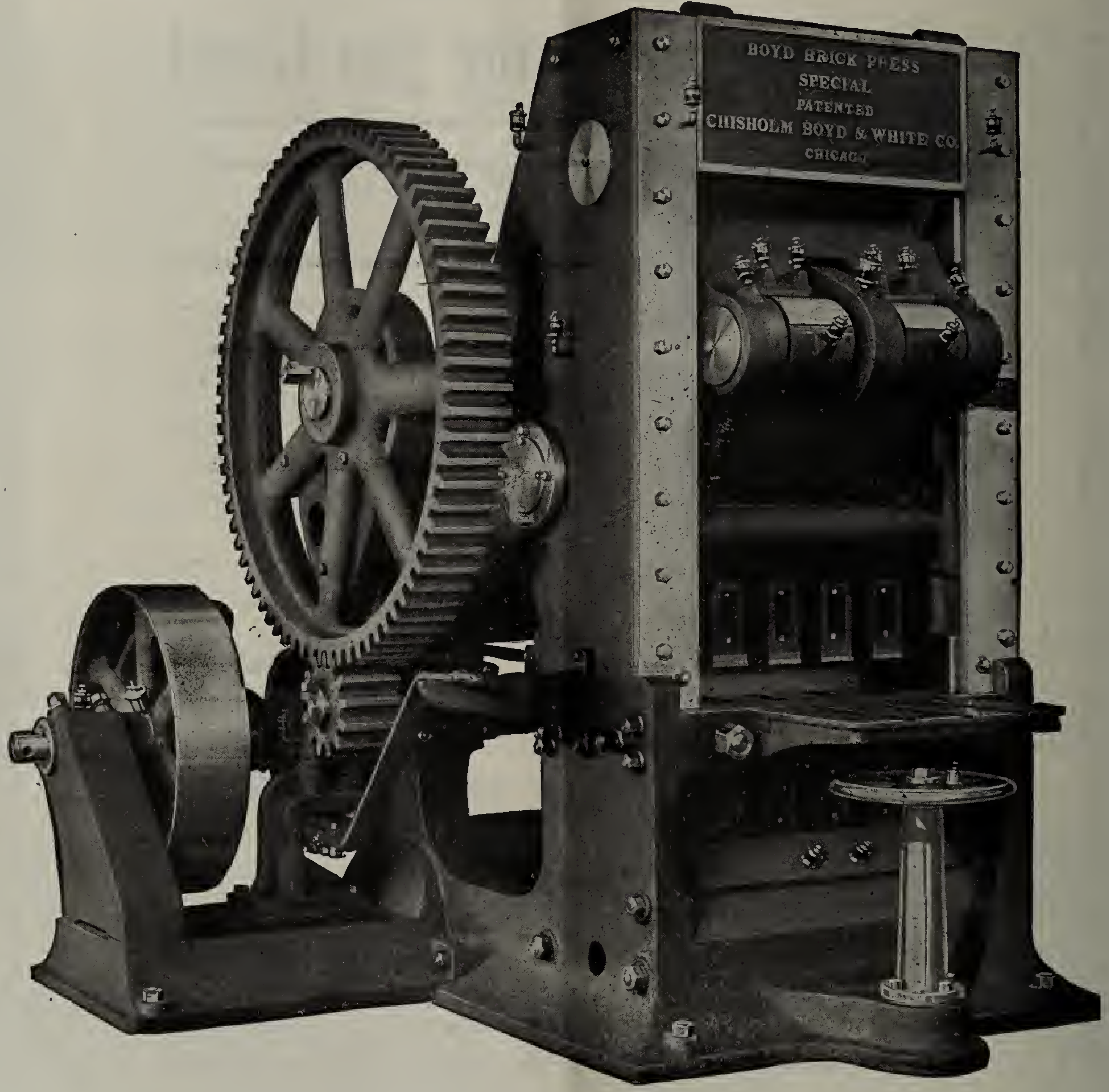
RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



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FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

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Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

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Stowell, E. R.

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International Clay Mach. Co.

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Ceramic Supply & Con. Co.
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Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
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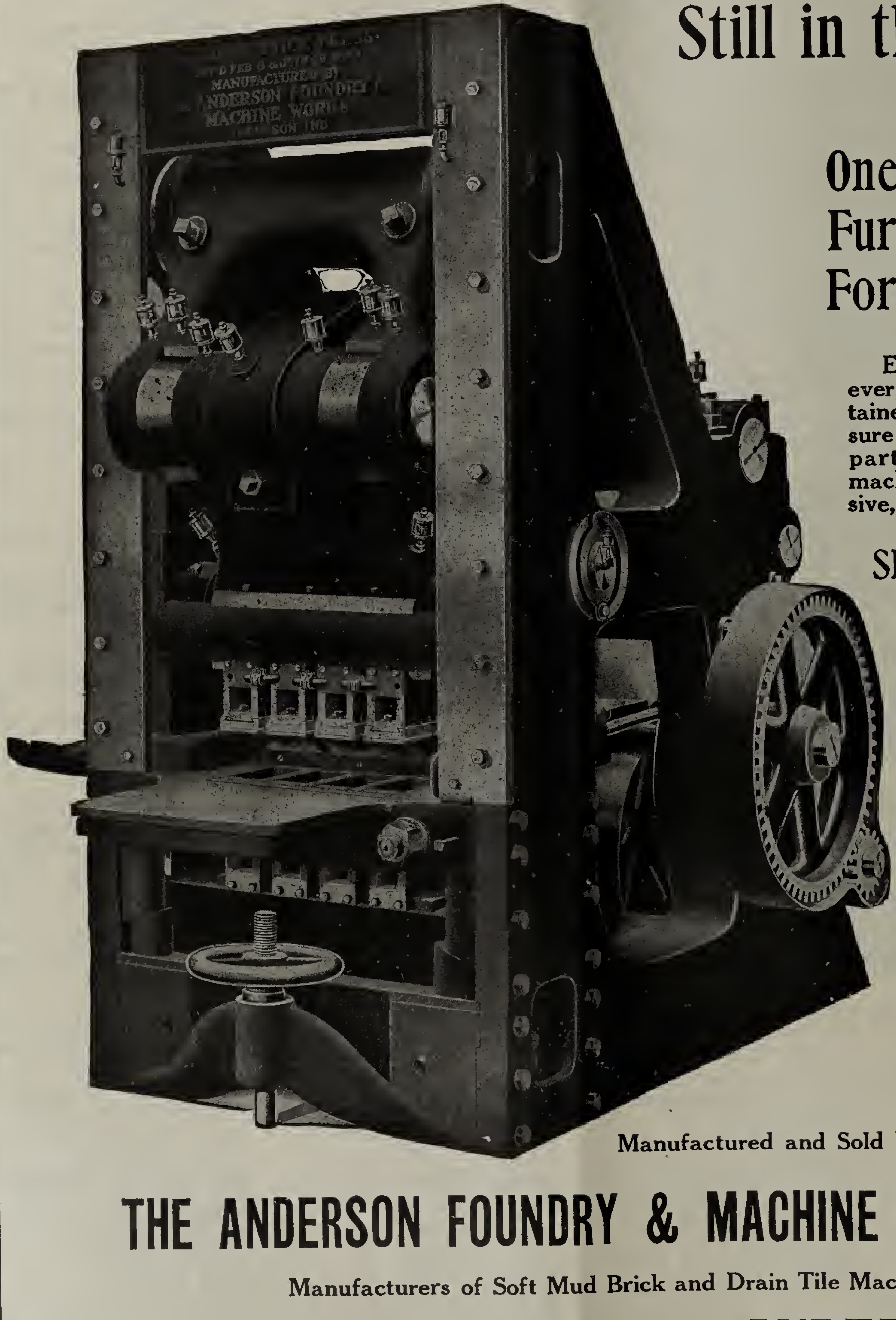

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(See Supplies.)

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Hensley, J. W.
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International Clay Mach. Co.
Lakewood Engineering Co.
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Taplin-Rice-Clerkin Co.

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Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White.
Eastern Brick Machinery Co.
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Frost Mfg. Co.
Hensley, J. W.
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Brown Instrument Co.
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(See Barrows.)

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(See Pans.)

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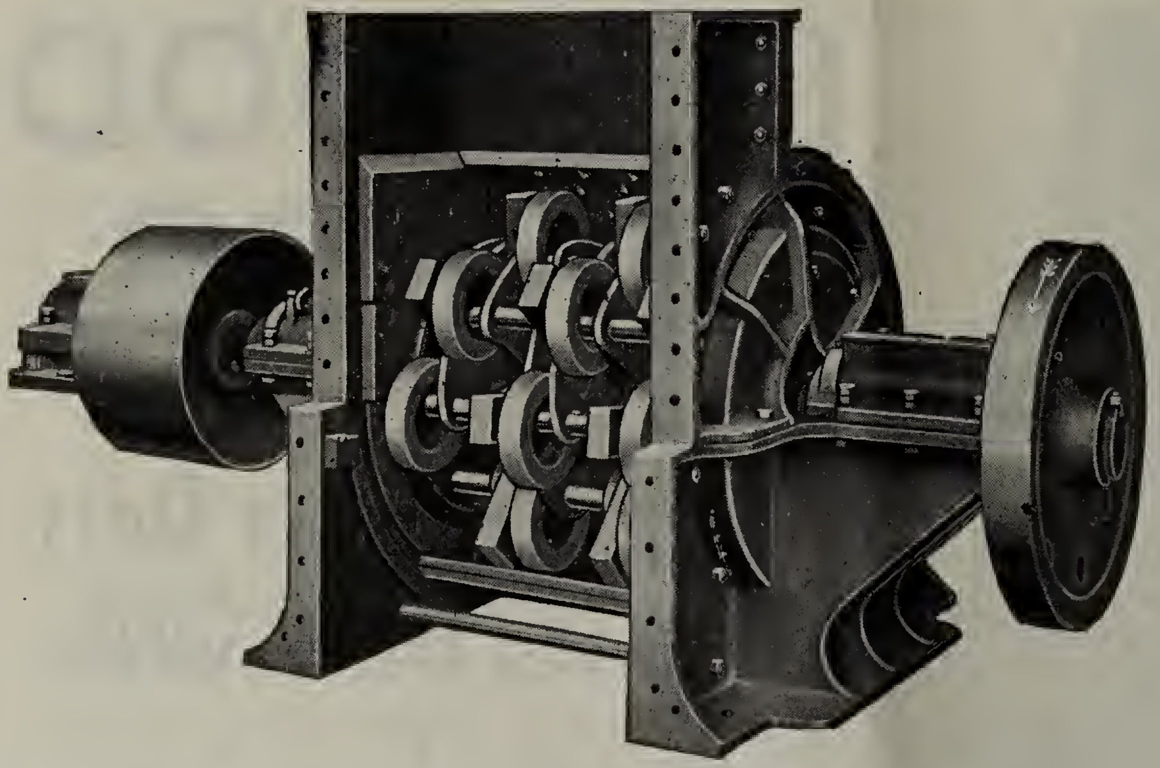

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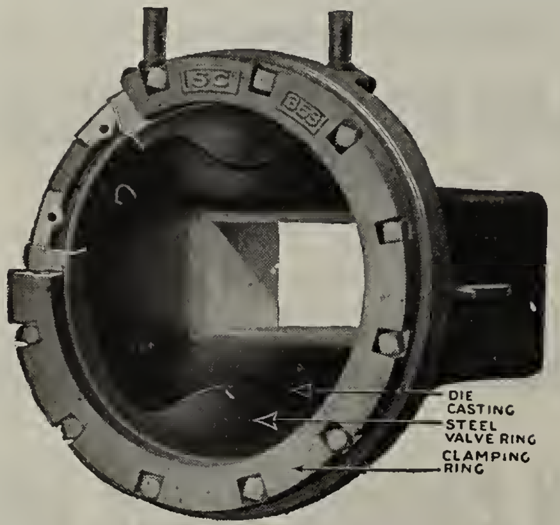

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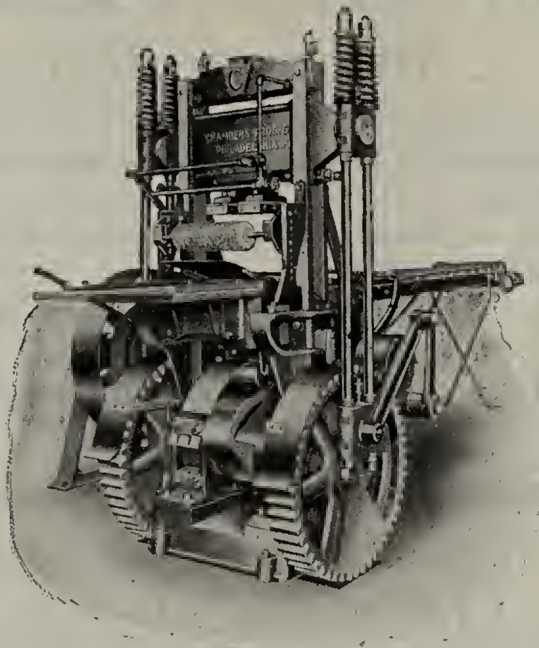

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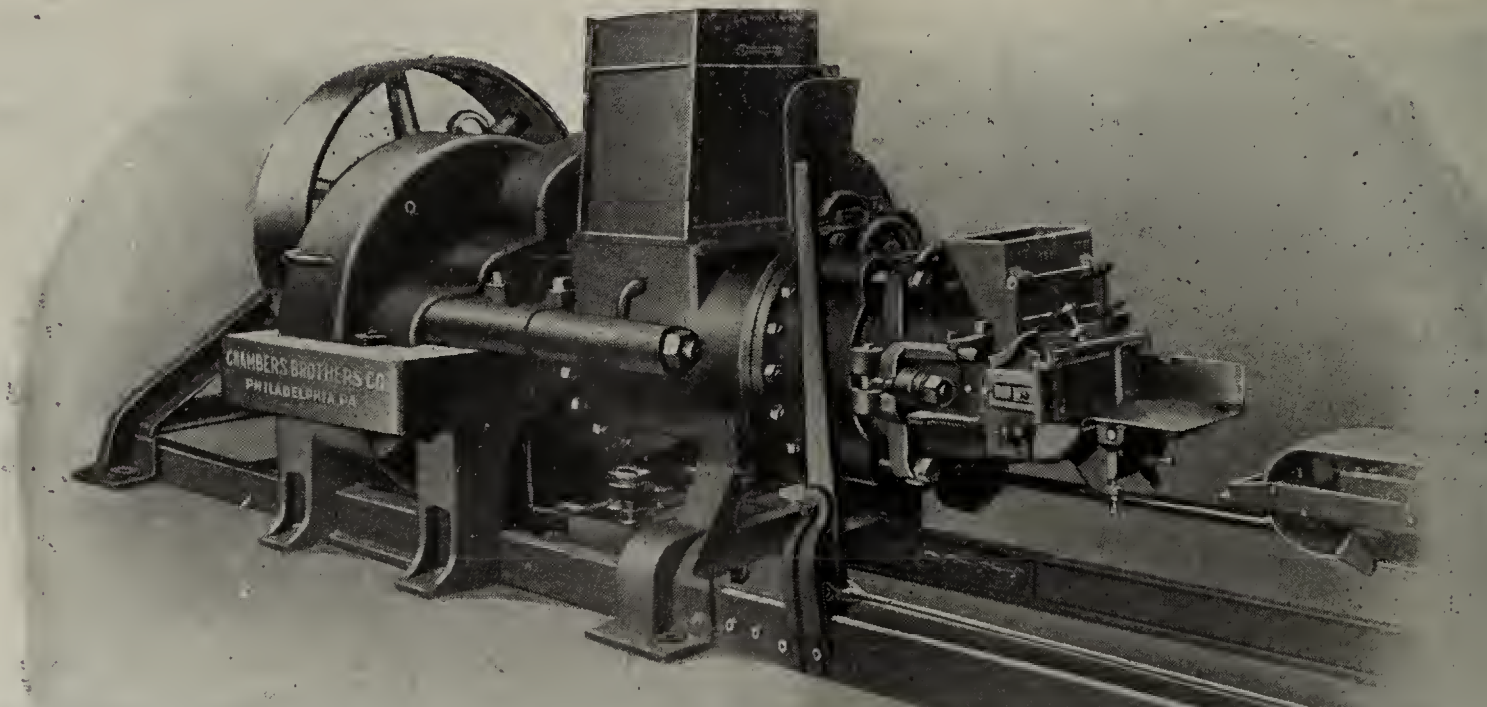

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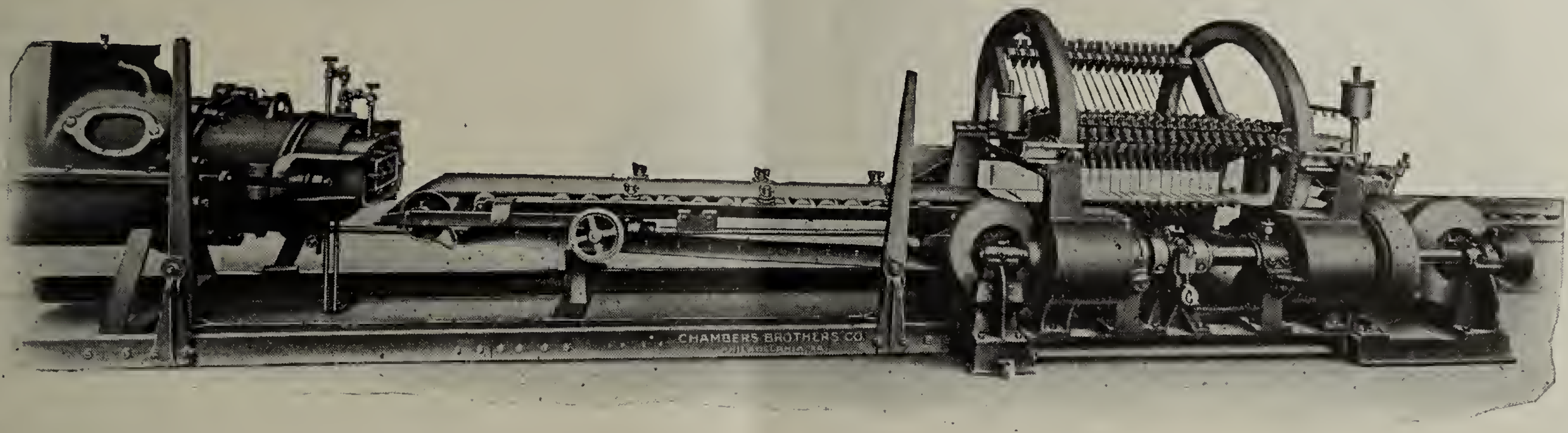

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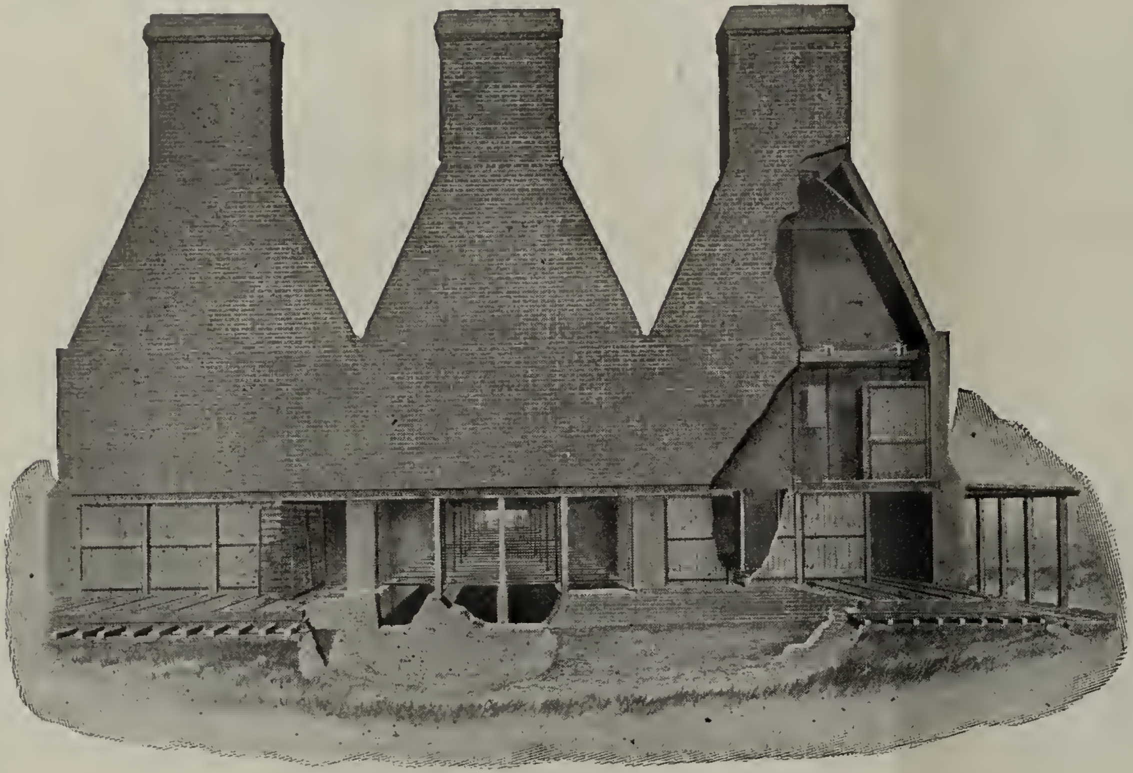

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. LXVI. INDIANAPOLIS, IND., JULY, 1916. No. 1

Written for The Clay-Worker.

MEETING OF INSTITUTE OF PAVING BRICK MANUFACTURERS.

Select Party of Boosters Inspect the Plant of the Alton Brick Company, the Brick Streets of Alton, and the First State Aid Road There, a Fine Example of Modern Monolithic Roadway.

THE QUARTERLY meeting of the Institute of Paving Brick Manufacturers, held at Alton, Ill., July 13, was the most select gathering of that organization that has yet been held. Only four plants were represented, namely, the Purington Paving Brick Company, by Messrs Orr and Terwilliger; the Bessemer Limestone Company, Youngstown, Ohio, by Messrs. Thomas, Wallace and Weaver; the Alliance Clay Products Company, Alliance, Ohio, by Secretary Wilcox, and the Alton Brick Company, by Eben Rodgers and Mr. Meyer. Representatives of the trade press and other visitors swelled the attendance to a baker's dozen or more, each and all of whom have Eben Rodgers to thank for a very delightful day. The visitors were met at the station and motored to the model paving brick plant of the Alton Brick Co., where the modus operandi of making high-grade paving brick at the rate of 80,000 per day was fully explained. Every feature of the splendidly equipped plant was inspected and the entire routine of the work was explained to the smallest detail. No information was withheld. There are no trade secrets in Eb Rodgers' book of knowledge. His experience can be drawn upon by any fellow-craftsmen who may journey to the city of Alton in quest of information at any time, and especially when they go in groups, as in this instance, representing the N. B. M. A. or any of its allied associations.

Paving Brick Boosters at the Alton Country Club, Mayor Beall on the Right.

The plant has many interesting features, and in its general aspect appears quite different from most brick plants. There is an air of stability about it that is very pleasing to those who like to think of a brick plant as a permanent institution, and not a temporary or makeshift affair. The buildings are of brick and steel, well designed, and the equipment of machinery, dryers and kilns is of the most up-to-date and efficient character.

After inspecting the plant the party motored to the Country Club, where a fine chicken dinner was served on a cheery plaza overlooking the golf links, towards which several of the members cast longing eyes. The party was honored by the presence of Mayor Edmund Beall, who has gained fame by introducing in the State Legislature, of which he is a member, the measure providing for a State Vice Commission, in which he figured prominently, the investigation being quite thorough and resulting in a country-wide discussion of moral reform. Recently his Honor's genial and fatherly face has been made familiar to picture show patrons throughout the land as one of the principal performers in the film play, illustrating the essential developments by the Vice Commission, entitled "The Little Girl Next Door."

Mayor Beall told in an entertaining and impressive way many of the strange experiences encountered in the reform work and the instances incident to the making of the pictures for the film play, which is a very serious performance, when a great sensational production is undertaken. His Honor insists that if the picture leads the good people of the country to see and realize some of the tribulation and stress under which the "other half" lives, the fortunates will be more charitable toward the unfortunates, and as a result needed reforms will come more quickly.

After saying "good-bye" to his Honor, the party motored to the immense plant of the Illinois Glass Company, which, it is claimed, is the greatest establishment of its kind on the globe. It produces a million bottles a day, ranging in size from a half ounce vial to a gallon bottle. They are now installing two improved Owens machines, that will "blow" five and ten-gallon bottles, a feat that has heretofore been considered as impossible. The company now has twenty-seven of these machines in daily use, and employs about 2,000 workmen. Before the machines were introduced they employed some 3,000 hands. The machines are marvels of ingenuity and are operated in conjunction with a furnace containing a mass of molten glass, which is sucked up into a steel mold and automatically formed into a bottle. Busy, perspiring workmen take the bottles, while redhot, from the molds, grasping them with long-handled tongs, placing them on a table, from which they are taken by other workmen with still longer handled tongs, in bunches of three to a dozen, according to size, and carried to annealing ovens, in which they are cooled gradually and then inspected and packed for shipment. This all sounds simple in the telling, but the perfection of the glass-blowing machine is one of the wonders of modern mechanics. It is doing the work that shortened the lives of glass blowers, and while its introduction was opposed bitterly by the workmen, it will undoubtedly prove a boon or blessing in disguise to that division of the other half. The plant is run day and night in two shifts, the workmen taking frequent breathing spells at stated intervals, thus gaining needed relief from the intense heat of the molding room.

A fierce rainstorm added variety to the occasion and kept the visitors at the plant longer than was originally intended, and put the party in a frame of mind to enjoy a swim, so they were taken to the Mineral Spring Hotel, where a plunge into a fine pool was much enjoyed. Here, too, Eb Rodgers proved the star performer by turning somersaults from the springboard. It will not surprise us at all to see his Apollo-like form among the movies. It will certainly prove a drawing card.

At 6:30 a formal dinner was served at the Illini Hotel, in the spacious, airy dining room on the third floor, overlooking the Father of Waters, which, shimmering in the moonlight, was a picture no artist can paint. Here we had the pleasure of meeting Edward Rodgers, Eben's father, who, though he has passed his three-score years and ten, is still active and takes a keen interest in the brick business and the promotion of brick highways. After the preliminaries Mr. Orr introduced Mr. R. M. Jackson, of Chicago, representative of the mining and power department of the General Electric Company, who spoke for an hour or more on "Electric Motors and Their Uses," illustrating his remarks with lantern slides. Considerable discussion followed, touching mostly on the present methods and rate of charge for power by producers of electric power for commercial purposes. It seemed to be the opinion of a majority of those present who were using electricity on their plants that with a good equipment current can be made cheaper on the individual plant than it can be bought at the present time; that is, the price charged is excessive compared with the actual cost of making electricity.

Alton's First State Aid Road.

The recent enactment by Congress of a bill providing for several millions of dollars annually for the building of permanent highways has put a lot of pep in the road-building game. Illinois has a State aid law, and as a result a stretch of country road near Alton, two miles long, has been paved with Alton brick, and its excellence is attracting the favorable attention of the taxpayers of that section. It is indeed a fine roadway, smooth, clean and durable, affording a means of quick communication between the city and the country. Farmers find they can haul heavy loads over this character of road with little stress on either road or vehicle, and those who have autos, and their name is legion, can speed back and forth with safety. Safety first is a characteristic of brick roads, for there is little danger from skidding on a brick road at any season of the year. Whether wet or dry, a good brick road is the best driveway both for safety, comfort and economy. This, Madison county's first State aid road, was paved with the Dunn wire-cut-lug brick, from the kilns of the Alton Brick Company. It is 18 feet wide, and is of the new monolithic type of construction, the brick being laid in wet concrete without sand cushion and without a curb. It looks as if it would be good a hundred years hence, and is undoubtedly the road of the future.

A Fine Stretch of Brick Paved Country Highway Near Alton, Ill., the First State Aid Road in that Section.

Alton is a thrifty city of some 30,000 souls, built on the hilltops overlooking the Father of Waters. It is but a few hours' ride by boat down the Mississippi to St. Louis, and there is yet much river traffic, which naturally tends to moderate rates by rail. The city is pretty thoroughly paved with brick, and boasts of some forty miles of brick-paved streets. "Boast" is correct, for they are good brick streets and the property holders are really proud of them. Speaking officially, the city engineer, Mr. T. H. Landon, recently said:

"Brick is the only successful paving material that has been used in Alton in the last twenty years. We have brick streets that have been down sixteen to twenty years that are still in good condition, except where excavations have been made for sewer, water and gas mains and the pavement has not been replaced properly. Alton has many heavy grades paved with brick. I have just finished one on a 14 per cent. grade, up which teams now haul heavy loads. This indicates that brick provides a good foothold for horses. The most heavily traveled road leading out of Alton was paved about two years ago with brick. This was done under the supervision of the State Highway Commission at Springfield. Observations of traffic on this road convince me that the advantages of brick for city streets apply also to heavily traveled roads."

Several miles of brick streets are in course of construction at Alton, all with Alton pavers, and the good work will go on until every street and avenue is permanently improved, for the taxpayers of Alton have learned from experience that a good brick street is a permanent improvement, and they are wise enough to know and appreciate the advantages of patronizing home industries. Hence the Alton Brick Company is assured of a good local demand for its products in the years to come. However, it is not restricted in the least to the home market, but ships millions of pavers each season to points in Illinois and neighboring States.

The Alton Brick Company's Plant.

The plant has been in operation now five years, and it was so well planned that few or no changes have been found necessary in the intervening years. It is a fire-proof plant, there being no frame buildings to take fire and burn. The product of the plant during the past year has been largely Dunn wire-cut-lug brick. Otherwise the plant is practically as it was described in The Clay-Worker some years ago. As our present readers will undoubtedly be interested in a detailed description, same is repeated for their benefit.

Eb Rodgers on the Left, and Superintendent Meyer at the Factory Office.

The Clay Bank.

The company owns a tract of land of 165 acres, all underlaid with a bed of blue-gray rock shale about 35 feet thick, which clay is peculiarly adapted for making paving brick. The upper part of this shale consists of about one foot of shale, laminated with thin layers of sand, but above this shale there is a bed of good, strong plastic and bonding clay about five to six feet deep. This clay carries the sandy clay into a good vitrification, and by using the face of the clay bank from top to bottom, a perfect paving brick clay mixture is obtained, and that, too, with very little stripping.

There is employed an electric drill using 4-inch drills, and holes can be cut to any depth desired. The shots put in are just heavy enough to pop the clay off the solid rock, and shatter the clay sufficiently so that the steam shovel can readily handle the product. It is usually aimed to shoot off enough clay so that there is a little left to weather. There is in use a 70-ton Marion steam shovel, taking the clay away from a 30-foot face.

The clay is dumped into side dump cars, six of such cars making a trip for a steam power locomotive, which brings the cars to the first relay station. The average daily output of the steam shovel is about clay enough to make 70,000 9½-pound paving blocks. Between this relay station and the switching station there is a small hill, on the top of which is erected an electric hoist, which has an ingenious arrangement, whereby the same train of cars can go up hill and down hill without uncoupling or changing rope. From the switching station the cars of clay are brought into the factory proper by means of a steam hoist and the clay dumped into inclined storage bins, just forward of the dry pans. This steam hoist is the only steam-driven piece of machinery in the factory building and is retained because the exhaust steam therefrom is used to very good advantage.

The Factory.

The factory building is a very substantial brick building, and wherever it was possible wood has been eliminated and the building is as nearly fire-proof as a factory building could be constructed. The roof support is of the usual T and angle iron type and the trusses are designed strong enough to carry any weight. There is plenty of light in the building, in that all overhead shafting, pulleys and belts for same are cut out and free passage offered for all light rays entering the building. Every principal part of the operating machinery is supplied with its own electric motor and belt connected, thus making each machine a self-contained element.

The clay is next passed into four 9-foot Bonnot dry pans, each with a 35-h.p. electric motor. Each dry pan is supplied with an inclined hopper, made of concrete, so that the clay can readily pass by gravity to a carrier or conveyor. The clay is next elevated and passes over screens, which are supplied with the usual delivery and tailing spouts. The clay next is taken to the top of steel storage bins of their own design and of which there are two. These storage bins are 80 feet long, 34 feet wide and 22 feet high, and each holds enough clay to make over 1,000,000 9¼-pound blocks. The sides are constructed of 9-inch I beams embedded 3 feet in a solid concrete bed and secured besides with bolts in the concrete foundation. These 9-foot I beams are spaced 2 feet apart and are faced on the interior with ¼-inch steel plate riveted to the framing. The bottom has inclined bevel sides made of concrete, with a passageway at the lowest central point in the concrete work, temporarily closed to retain the screened clay and opened whenever it is necessary to take clay out. Over the top of each bin there is placed a very ingenious automatic reversing dumping arrangement to provide means for evenly distributing the clay in the bins. As the clay passes over this bin, the automatic arrangement deposits the clay in a stream into the bin, thus depositing the clay in thin layers as against the old method of dumping a carload in one spot. As this arrangement travels in sympathy with the clay conveyor mechanism, it is impossible to dump the clay in one spot, which, in turn, makes a very uniform clay mixture in the bin. This depositing mechanism is self-reversing when it arrives at either end of its travel over the storage bins.

From the storage bins the prepared clay is deposited by suitable conveying system into an automatic adjustable feeder built by the Ohio Ceramic Supply and Construction Company of Columbus, Ohio, and is doing good service. The tank is of good size, being 7 feet in diameter and 6 feet high. The entire machinery equipment was supplied by the Bonnot Company, of Canton, Ohio. From the storage bin the clay is fed into a heavy duty 12-foot pug mill, equipped with cut-steel gearing. From the pug mill clay passes to the Canton Special brick machine, which is supplied with an auxiliary 5-foot pug mill. This thorough pugging of the clay produces a column of clay free from laminations. The brick cutter is of the reciprocating side-cut type and has the Bonnot Special angle delivery, by which the cut brick can be turned and delivered at any angle desired. This arrangement has a tendency to make a more compact arrangement, which is an important factor, as space under roof costs money. The brick from the delivery belt are put through four Bonnot represses, with an arrangement of automatic waste return which carries all scrap back into the pug mill.

The brick are next put through four Bonnot represses so arranged that the scrap is passed back into the pug mill by a belt conveyor equipment. The repressed brick are then placed on transfer cars to be taken to the drying tunnels. At the time of the writer's visit he noticed particularly a device used on the cars and invented by Harry Meyers, the superintendent of the plant. The ordinary dryer cars have a top made of channel iron generally spaced to take up builders of 7-pound blocks. When making 9-pound blocks the spacing on the cars does not conform to the size of the 9-pound blocks, and in consequence thereof a great many brick have buckled faces. Mr. Meyers employs a ¼ steel plate, so perforated with slots that the 9-pound blocks will show no damaged faces, and the writer saw 9-pound blocks stacked four high without a blemish on them. It's a good thing, all right. The cars hold about 425 9-pound blocks.

Rodgers Tunnel Dryers.

On this plant the exhaust steam is used in addition to the ordinary direct heat and the results obtained are satisfactory. There are five tunnels, each containing four tracks; each track holds 15 cars, and this gives a tunnel capacity of 300 cars. It generally takes 24 hours to dry builders and 7-pound pavers and 30 hours to dry 9-pound blocks. The cooling tracks hold 80 cars, which have been found very advantageous for the 9-pound block. Each tunnel is supplied with its individually electric driven fan for removing the water vapor. The system was installed by the L. E. Rodgers Engineering Co. and has proven satisfactory in every way. There are no checked or cracked brick in evidence.

Continuous Kilns.

There are two systems employed, one, the older one of the Youngren gas-fired compartment kiln, and the later one, based on the experiences that were had in correcting errors of the older type. It may safely be stated that this firm was the pioneer in using gas fired continuous compartment kilns in the United States, for burning pavers. It must never be overlooked that paving brick are limited in their qualities by standard specifications, thus making the paving brick branch one of the most difficult of the clayworking industries. But on this plant all burning difficulties have been overcome and the product is first-class. To go into all details of the burning proposition with gas would make this story too long, but, anyway, let it be said that any one visiting this plant will readily be converted to the gas-burning proposition after seeing results obtained there.

The older Youngren kiln is of the parallel type, having eight chambers on each side, with, as originally planned, the watersmoking flue, gas flue and stack flue in between these two batteries. Each chamber is 35 feet 6 inches long, 16 feet wide and 12 feet high. As ordinarily operated, the conditions would be as follows: Chamber 3 and 4 setting, chamber 5 empty, chamber 6 drawing and 7 cooling, but opened up, chamber 8, 9, 10 and 11 air passing through for pre-heating, chamber 12, 13 and 14 taking gas for burning and advance heat passing through chambers 15, 16 and 1, the heat from chamber 1 passing into stack. Chamber 2 is watersmoking. To produce the required draft, there is used a 170-inch fan with a ¾ housing running at 260 R. P. M., but there is a great deal of trouble experienced with this kiln, in that only a single fan takes care of the heat vapors as well as the watersmoking vapors. In consequence, condensation of the water vapors, in the presence of the sulphur vapors coming from the coal, corrosion of the iron housing and fan parts takes place very rapidly and the fan draft proposition in this case is worthy of consideration. The chamber capacity of this kiln is 42,000 9¼-pound blocks, which are burned at 2050 and 2100 degrees F.

Continuous Kiln No. 2.

This kiln is of the single battery type and was designed by the firm to overcome all defects of the older system and at the same time adding other benefiting features. This kiln consists of 14 chambers, located side by side, and the waste heat from the last chamber, by means of an underground flue, is passed into the first chamber. Each chamber is 40 feet long, 14 feet wide and 9 feet high. Each chamber has a capacity of 30,000 9-pound block, or 40,000 7-pound block, or 50,000 building brick. The water smoking flue is separate from the fire draft flue. For watersmoking, a fan 120 inches in diameter, 175 R. P. M., is used, taking vapor from two chambers, one at a low heat and one at a higher heat, and in this way the heat is kept high enough so that no water vapor can condense, and as no sulphur vapor is present no corrosion of the fan takes place. There is a separate duct provided for the fire heat and requires a 110-inch fan, and as no watersmoking vapor is ever present, the fan has a long life. In this kiln the gas conduit is placed in the ground, each chamber having its stationary up-take and in-take, and in this way the moving of the portable gas in-take of the older system is done away with.

The operation of this kiln is about as follows: Unloading one or two chambers, setting one or two chambers, watersmoking two, gas firing three, preheating three or four and cooling four or five. Each kiln is provided with a battery of two four-hopper square Youngren gas producers, and as they are of the suction type, the gas making is controlled by the velocity and strength of the draft. In each type of kiln the fire bags are placed 3 feet 6 inches apart and the individual gas valves are thus placed 3 feet 6 inches between centers. In this way the flow of gas can be regulated for each fire bag in turn governing the temperature. Each chamber is provided with the necessary gage holes, peep holes and clean-out holes. All chambers are provided with necessary draft gages and electric pyrometer in such a way that they may operate in series, in train or individually.

Equipment.

Kiln No. 1 is supplied on both sides with depressed loading tracks so that the kiln bottom is on a level with the car floor. Kiln No. 2 has a similar track only on one side, the other side being taken up with underground flues. The Mathews gravity carrier system is used when loading brick from the piles that have been stored. It is claimed that the gravity system makes a saving when used at this time. The operation of the plant is carried on in groups, each subdivision having its gang boss, who is responsible for his department. Each department has its own telephone, with its own switching outfit, so that any one department can call up any other department, without connecting through a central switchboard. This system has more than once proven its utility and it is hard to believe that the company could get along without it.

Central Coaling Station.

Is located close to the power house and consists of a deep pit located under the railroad track. This pit has inclined sides and a sliding door at the bottom for regulating the flow of the fuel. Underneath this door is a drag conveyor working in a short metal trough, and carries coal to a central station, from which, on endless belts, the coal can be carried either to the power house or the gas producers. At either place the coal is put in storage in overhead iron tanks, each supplied with the necessary and appropriate feeding spouts, those at the kilns being stationary, while those at the boilers are of the swinging type.

Power House.

Is a large, massive brick structure, with iron truss roof, well arranged and well built. The boiler and fuel department is located in a separate part of the building from the engine department.

There are two 300-h.p. boilers equipped with automatic chain grate stokers, which are fed with swinging spouts, connected to overhead iron storage bins. The boilers are also equipped with "economizers," thus reducing the fuel bill. The draft is of the "induced" type and the fan and engine equipments required are in duplicate, so as to be prepared at all times for a breakdown. For day service there is used a large Hamilton Corliss engine connected with a Northern Electric generator, which develops 600-h.p. There are about 41 motors in all on the premises, of various sizes, all belts connected to their individual machines, such as:

125 H. P. for brick machine.
40 H. P. for pug mill.
35 H. P. for each dry pan.
15 H. P. for represses.
10 H. P. for automatic feeder, etc.

For night service there is used a 4 valve Erie "Ball" engine connected to a Northern Electric Company generator. The water supply is an independent one, coming from the Mississippi in that it was found that the pond water used for pugging the clay was unsuitable for boiler service.

DOLLARS IN A HILLSIDE.

By Paul R. Strain, Wellsburg, W. Va.

MR. HONSON says the idea did not come to him all at once. He thought at first that if he had a wagon road on the old Indian trail that descended the Point directly towards Fawnsbee it would save him at least two miles of a drive each day, going into town with his milk wagon. For the public road which he used wound around interminably, leaving his hilltop farm before reaching the lowland on which Fawnsbee was built. So, while he could look down into town at a distance of a half mile or more from his house, it was fully three miles there by the road. His land reached to the county pike, almost on the borders of town, and the grade down the long point of land was a fairly easy one, but a very steep part at the very bottom had discouraged the thought of a road there ever before. This place, though quite steep and rocky, was short, and he soon was able to stake off a slanting line about four hundred feet in length, along the face of the cliff, that would afford a very reasonable grade for a wagon road.

Then he hired a man with dynamite, at a total cost of about $40, to blast out a rough road along the line of stakes he had set. Then with team and plow, and sons as helpers, he soon had a very passable road from his house across the back pasture, down the Point on the old Indian trail, and on to the county pike. The time he would save on the road in three or four months he figured would fully repay him for the cost of the road.

Down the Point the road led all the way through dwarfish, second-growth kind of timber. Not much good, he thought, for anything but pit-posts. Now there is really little money in cutting and selling mine props, and Mr. Honson was a good enough business man to know it, but it gradually came to him that it might pay to open a coal mine. The country "coal banks," as they are called around Fawnsbee, were crowded with orders, besides many cars of coal were shipped into town each season. His land was underlaid with several acres of the Pittsburgh seam; so he decided to open it.

Will Honson had watched the blasting of the road; so he undertook the job of cutting and blowing out a big trench on the hillside on a level with the coal seam, into the face of the coal, to provide an entry, drainage and an easy grade for running out the coal. Timbering and posting up around the mouth, the newly started mine was now leased to a practical miner for a term of years, the owner to get the usual "bank leave" of one cent for each bushel of coal removed. In this section, where the Pittsburgh seam is from four and one-half to five feet thick, this leasehold returns the owner at the rate of $1,500 for each acre of coal removed.

Mr. Honson granted his son Will, in return for his work in opening, the monopoly of the hauling from the mine, which affords most handsome returns in itself, the usual charge being five cents for each bushel of coal delivered to the customer, in addition to the cost at the mine. Being entirely a downhill haul, very large loads were possible, and accordingly large wages were possible for the hauler.

Mr. Honson was at the station one day when he fell to talking with some farmers who had come in for a car of agricultural lime. Learning that hydrated lime was costing them $6.50 a ton, plus the freight, he fell to thinking of his hillside possibilities. Always a few feet below the Pittsburgh seam of coal lies a thick layer of limestone. Why not burn lime for sale? He had the limestone, and coal and wood on his hillside to burn it.

Labor was high in this mill town of varied industries, so dynamite was used largely for quarrying the limestone; not only for quarrying the stone itself, but for stripping the overlying earth from it by means of discharging several blasts simultaneously in the ground by means of electricity.

The first kiln of lime was burned and sold by posting a sign at the foot of the hill road on the pike, announcing burned lime at $3.50 per ton. The farmers were glad to get the lime at that much saving a ton from the price of hydrated lime; and, though of course loose, they did not mind that, knowing they were buying no water. Best of all, from Mr. Honson's viewpoint, was the $2.00-a-ton profit on his first sixty-ton lime kiln.

The next step, putting in a stone crusher, was a natural one, and resulted from the demands of farmers who wished finely ground stone lime for their lands, disliking to use quicklime for fear of burning up their humus. It being out of season, a threshing engine was rented and a stone crusher bought. Mr. Honson's son Carle, who was in a machine shop in town, was induced to come home and run the crushing outfit.

Seeing a fair market beginning to open up for burnt and crushed lime, my friend decided to bring his product closer to the public and thereby much increase his sales. So far his enterprises on the hillside had paid rapidly for themselves, so he felt justified in increasing his investments. From a failing oil field near at hand it was an easy matter to procure some strings of eight and ten-inch casing. These were laid from well-built platforms alongside the pike, on his land, and ran up the hillside about 800 feet to the stone crusher and the burning kiln. Then gravity brought his lime down the steeply laid pipes to the proper receptacles at the bottom, convenient for loading and hauling out on the level county pike. One platform held the burned lime, another the finely ground agricultural lime, while the third bin held the coarser pieces, marketed principally to the county for metaling the pikes.

Coal, wood and stone were all moved down hill to be burned, so also the finished lime got away. These simple bits of management, together with the intelligent use of explosives in quarrying, made possible the selling price of only $2.50 per ton for finely ground stone lime, and gave besides the profit of just 50 per cent. Not so large a profit as he is making on his burned lime, but the output is uninterrupted and daily larger.

Mr. Honson's plant has only been in existence about two years, but he says the old hillside, formerly worthless to him, is now the best paying part of his farm. While he has not yet developed all his schemes for turning its possibilities into dollars, he says he is already satisfied with his investments there, aside from financial returns, insomuch as all his sons are furnished good paying work right at home.

Are there not other farms with waste places that could be developed in this or other profitable ways?

BURNING CLAY WARES.

(By Ellis Lovejoy.)

CHAPTER II.

Bond.

THE BOND IN a common clay ware is the cementing together of the grains of the clay mass. The grains may be coated with finely divided material either as dust in dry pressed ware, or sludge in suspension coating the grains as the water in mud ware evaporates. This finely divided material is the flux which starts the fusion and which hardens in cooling to a permanent cementing material. The fused material will naturally collect where the angular points of the clay grains are in closest contact. It is possible, even likely, that where the clay grains are in close contact that there will be surface fusion because of the contact of the two surfaces, but it is of no moment whether the fusion is due to fine material coating the grains or to close contact of the grains.

In a clay ware the initial bond is due to fusion of some portion of the clay mass and the fused material serves as a cement to hold the mass together and to resist the action of weather agencies.

As the temperature advances the volume of fused material increases by solution of the more refractory minerals and by the development of other eutectic mixtures, and the pores of the clay mass are filled with the fused material. In the initial bond we have an aggregate of grains cemented together; next a fused matrix in which are embedded the grains of more refractory material; finally a mass approaching glassiness in its structure. Some clays are made up of quite similar materials, all of which enter into the fusible mixture and develop a glassy body quickly. Other clays are made up of widely differing refractory materials and the most refractory grains are slow in dissolving, resulting in a granitoid body.

In the fusion process there is not only solution, but also chemical reaction, and in the cooling process other definite minerals are formed in the matrix which may play an important part in the structure and toughness of the bonding mass.

The Chief Minerals in Clay.

The chief minerals in clay other than kaolinite and often far in excess of the kaolinite, are: quartz, mica, feldspar, iron as protoxide, oxide, sulphate, sulphide and carbonate; lime as carbonate and sulphate; carbon as coal, bitumen, and vegetable matter; magnesia as carbonate and silicate.

There is a long list of minerals which might be enumerated, but the above list includes the minerals which are the most common and which have marked effect upon the burning behavior of clays.

Kaolin.

Kaolin when pure fuses at cone 36 (3362 degrees F.)

Note—Cones are ceramic mixtures in convenient form used to denote the fusion point of clay bodies, but they are not accurate in the determination of temperatures, and should not be used for this purpose. Cones will fuse at higher or lower temperatures according as the heat is applied quickly or slowly and the low temperature cones are materially influenced by the character of the kiln atmosphere. Since cones are ceramic mixtures they are especially valuable in measuring the temperature required by other ceramic mixtures because both are similarly affected by kiln conditions.

Kaolinite is the refractory base of clays, although lime and magnesia are more refractory, but they occur as impurities and, being strongly alkaline, act as fluxes in conjunction with more acid minerals.

Where lime is excessive in amount, exceeding the kaoline base, its action is that of a refractory, but in the ordinary clays it is simply a flux.

Bauxite fuses at cone 42 and is much more refractory than kaoline, but it should be considered as a separate mineral, since it does not commonly appear in clays. Where conditions

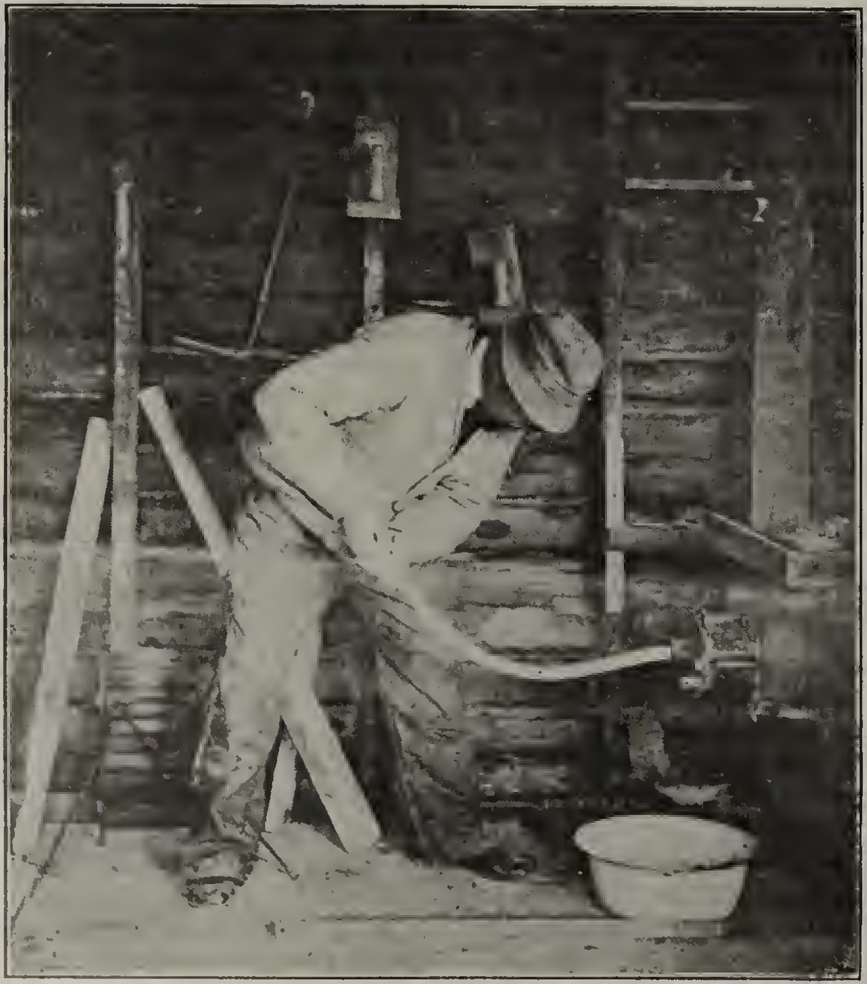


Figure 3.

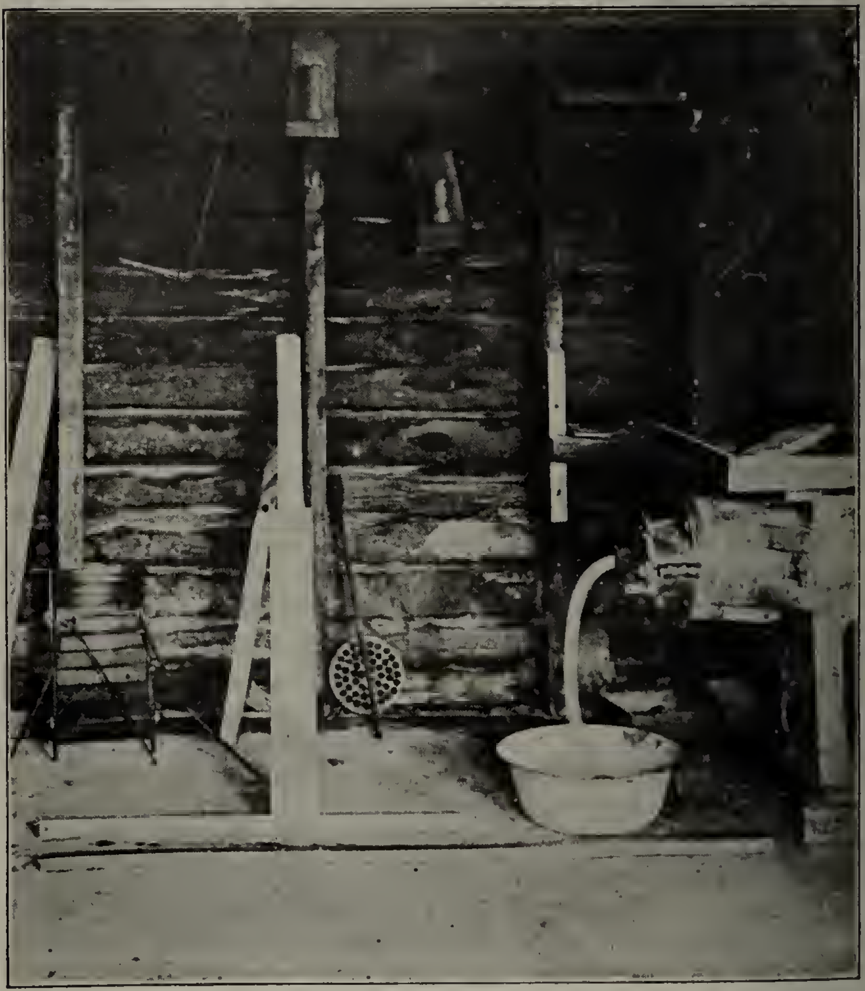


Figure 4.

have been favorable for its development it is found under clay beds, in clay beds and above clay beds, and apparently has been derived from the clay, but its occurrence is relatively rare.

The property attributed to kaolin which makes it valuable to the clayworker is plasticity, but as a matter of fact pure kaolins are not highly plastic. All that can be said is that we do not know "why is plasticity." Impure kaolins, such as ball clay, are highly plastic, and still more impure clays, such as gumbo, are even more plastic. Flint clays, which in composition are often pure kaolins, have no plasticity.

Some very plastic clays when made into ware and dried develop a very hard body, almost rock-like, while others equally plastic develop relatively tender bodies in drying.

The illustration No. 3 shows the most plastic clay we have ever tested. A good plastic clay flowing from a one-inch die will ordinarily break under its own weight when unsupported at about eight inches. The material in question which was a shale did not break, but bent down until it touched the ground, thus giving the free end a support.

It was then run out, as shown in illustration No. 4, supporting the free end, and the bar was over five feet long before it broke. The full length bar is shown on the floor in illustration No. 3 with a three-foot rule back of it. The dried ware from this shale had good strength, but nothing unusual.

Very plastic clays, such as clays and gumbo, are very difficult to dry without cracking, but the shale illustrated was first class in its drying behavior.

Our opinion of plasticity is that it is due to some physical property of the kaolin, probably extreme fineness of grain; that the grains of kaolin possess high adhesive power and at the same time selective, as we know to be true in Fuller's earth; that the impurities coating the grains of kaolin serve as a lubricant when moistened, permitting slippage of the grains; that these impurities when the clay is dried serve as the cementing material to bond the clay mass together and the strength of the dried ware is dependent upon the character of the impurities; that the drying behavior of the clay mass is dependent upon the degree to which the pores of the clay mass are filled by the impurities, or by colloidal material.

The study and discussion of plasticity is greatly interesting scientists, and it is to be hoped that the result of their work will give us a theory the application of which will enable us to develop or reduce plasticity to any desired degree, and to overcome the troubles which are associated with it.

Plasticity is not a burning problem except in so far as it develops faults in the ware which appear in the burned product and because of the burning.

Plasticity is the important property which makes clays valuable in the ceramic industries, and we know that plasticity in the clay is due to the kaolin, although pure kaolin is less plastic than many clays. We are not concerned whether the plasticity is a property of the kaolin or induced in the kaolin by salts and other minerals.

Kaolin is a hydrous alumina silicate containing 13.9 per cent. of chemically combined water which comes off in the burning at temperatures between 800 and 900 degrees F.

Common clays have chemically combined water in proportion to the content of kaolin or other hydrous minerals, and the quantity varies from to 3 per cent. up to 14 or more per cent.

Clay takes up a relatively large amount of water, commonly called free water or moisture to distinguish it from the chemical or combined water, and this free water is so closely held by the clay that seldom can it be squeezed out in the manufacturing processes, although frequently the pressure to which the clay is subjected in forming the ware is quite heavy.

This free water is removed largely in the drying, but the removal of the last traces of it is an important stage in the burning process.

Kaolin is subject to a large reduction in volume as the burning progresses, and likewise clay in proportion to the content of kaolin. Shrinkage is not a property peculiar to kaolin, but it is an important factor in developing a dense ware without carrying the burning to an extreme degree of fusion, and it is fortunate that kaolin possesses this property in high degree.

Shrinkage is often the cause of considerable loss in the burning in that it increases the difficulty of keeping the ware in place and also in that provision must be made to relieve the strains developed by it to prevent rupture of the ware, but at the same time it aids in the operation of burning in that it is an excellent measure of the progress of the burn.

(To be continued.)

MACHINERY HOUSES AS DISTRIBUTORS OF FIRE BRICK.

An interesting phase of the market field for fire brick is furnished by certain lines of machinery houses and the fact that often they are looked to send the necessary fire brick right along with the machinery.

This is easily noticeable in connection with the export trade to certain sections of the world. If an equipment of machinery includes boiler and calls for the use of fire brick for lining the furnace walls we find fire brick and block is quite generally included in the shipment of machinery. Moreover, it seems from reports at hand that in the Latin-American countries those requiring fire brick look to the machinery supply houses for this product. This would suggest that the machinery supply houses while they may receive brick along with complete machinery equipment specifically ordered, they may also buy and carry on hand stocks of brick to meet the needs of customers.

Not only is this connection between the fire brick trade and the channels of machinery trade noticeable in the export business, but we have it more commonly perhaps than the average man is aware of in our own domestic trade. A man may buy a saw mill outfit, for example, including boiler and engine and specify that there be shipped along with the boiler and its fittings the necessary fire brick and blocks to line the furnace and fit up the boiler all around. That this is frequently done is well known to the writer personally. If it is done in connection with saw mills we may as well expect the same thing, no matter whether it is a cotton gin shipment or what it is in the way of machinery that calls for a boiler or a furnace setting of any kind.

Indeed, there are many other lines of machinery aside from steam boilers, which call for the use of fire brick, and with which the manufacturers and shippers of the machinery may be the logical people to handle the brick. There are furnaces and evaporators for many different purposes including everything from the metal-working industries to farm and plantation requirements, and when we take stock of it all, it becomes easily evident that the machinery houses constitute quite a fruitful field for marketing fire brick and other fire clay products.

The question about it all with which the refractory products branch of the clayworking industry should concern itself with, is whether or not enough thought and attention has been given to the cultivation of this field and to the developing and enlarging of the trade. If it has not been industriously cultivated, if the clayworkers have devoted themselves mainly to the filling of orders that come from such institutions, they may improve the situation considerably by making a study of this phase of the business with a view to active exploitation and to the final developing of this channel of trade into the largest practical proportions, and trim it into the best kind of working form. It is a line of endeavor that should continue materially to enlarging trade in the export field, and friendly connections with machinery and machinery supply houses ought to help considerably in the domestic field.

The Future of Ceramic Education in America.

By Prof. Edward Orton, Jr.

I TAKE UNUSUAL pleasure in addressing myself to this audience of New Jersey Clayworkers. For New Jersey was the first state in the Union to attain wealth and prominence from her clay manufacturers. In a way, therefore, her clayworkers represent the intelligence of the industry. This must be so, or else we must conclude that success is fortuitous. And every speaker who has anything to say, wants to say it to an audience that count.

I have been told by several of my friends among you, that the policy or plan or Ceramic education in New Jersey is under active discussion at present, and that out of these discussions changes are likely to ensue. The importance of clear, accurate thinking in educational plans cannot be over estimated. If you in New Jersey have made up your mind to do something, you had best be very sure you are on the right track before you move. I do not mean that unanimous consent is to be expected in any educational plan—such a thing can never be had—but that a considerable majority should not only agree on the fundamental features, but should have the enthusiasm, conviction and determination to insist on having their way.

In order to gain a clear view of the whole field of ceramic education, it is proper to consider not only our own efforts in the United States, but also briefly to review its status in other countries which have developed special schools for this subject. And since these foreign schools have mostly antedated our own, we may well begin with them. It will not be worth while to go into any careful historical review of their founding, but only try to get a just idea of what their systems have thus far developed.

In this field, as in most other branches of applied science, Germany has been the leader. There were seven ceramic schools in existence in Germany and in German-speaking Austria in 1895. Some of these were then old and well established, and others were yet new. The German and Austrian ceramic schools, so far as I have had opportunity to see them, or learn about them from their teachers, their graduates and their catalogues, are primarily trade schools. They take young men and boys who have had the equivalent of our American common school education, with possibly the equivalent of two years of our high schools, together with some industrial experience, and in three years, give them a course of elementary science, and a very complete and thorough drill in the technical side of clayworking. Their theoretical studies are the elements of mathematics, physics and chemistry. They do not progress far in any of these branches. But they are taught enough of each to understand the chemical and physical calculations of glaze making, body making, drying and burning. They are more highly specialized than our American schools, one being devoted wholly to pottery making—another wholly to brickmaking—another wholly to glass making, etc. In the pottery schools, for instance, the pupils are taught to draw free hand, to model, to make molds, to press, to cast, to throw, to finish ware, to decorate and to fire. In each of these practical branches, the training is long and arduous, and the personal skill required for credit is very considerable. A graduate, still a young fellow of eighteen to twenty, expects, on going into a pottery, to be an employe of the upper class—but an employe nevertheless, with no immediate likelihood of ever becoming anything else. Such training does not lead to ownership, or even positions in the management, and the young man must expect his advancement to be dependent upon his personal skill as much as upon a better education than the workmen.

A graduate of such a school is not of the "gentleman class," has not had a professional or engineering education, does not often aspire to get it, and cannot reasonably expect to become other than a high-class mechanic or subordinate boss. In short, he is a non-commissioned officer, and cannot expect to overstep the deadline between his rank and that of the manager and owner.

There are no ceramic schools of university grade in Germany, similar to those in this country. Theoretical ceramics may be studied as an elective subject in the Technical High School, in the department of applied chemistry, but it is not a systematic branch of engineering education, leading to a degree.

Of French ceramic schools, I know little. I have heard indefinite stories of a school under government patronage at Limoges, and of a research station at the government porcelain factory at Sevres, and have from time to time furnished photographs, catalogs, curricula and letters to various French authorities who were looking the subject up, but to the best of my knowledge and belief, France has no well-developed school, either private or governmental. Her contributions to ceramic science have been great, but they have come through their universities, higher technical schools and savants, who have studied the industry after a broad and thorough university training, not directed specially to ceramics. Le Chatelier, for instance, is a professor in the School of Mines, but is known the world over for his contributions to the silicate industries.

Edward Orton, Jr., Columbus, Ohio.

The English were a little slower than we in America in starting specialized training in ceramics, and with true English conservatism have followed a system of technical training of their own, with little regard to anybody else. The number of schools is very limited, only two, so far as I know, and both of these are pottery only. Their organization seems to an American to be defective. They are primarily night schools—for the training of operatives who have done their day's work in the pottery, and whose desires to get on goads them into using their evenings for still further work. Further, they are divided into several divisions—artistic, involving drawing, printing, modeling, designing and decorating; practical pottery work, involving mold making, throwing, finishing and other factory operations with some mathematics; chemistry, including body and glaze making, principles of firing, etc. The curious thing about it is that these courses are concurrent, but not confluent. A young man must decide which he will take, but no course he chooses will cover the whole field or give a broad idea of the way the different parts co-ordinate.

An Address before the New Jersey Association of Clayworkers, June 30, 1916.

It seems that this failure is intentional on the part of the management of the school and that they want men to fill intermediate stations in the industries and do not want leaders or managers.

On the other hand, the night school product must not be construed as the sole output of the English schools. They usually have a select few day scholars, who really are to all intents and purposes special students, under the direct care and leadership of the masters. These few do not follow any exact or published course of study of any given duration, nor do they get a degree at the end. They study with the master till the master thinks they are competent. They do not study one thing with one man and another with another, but one man leads them in all their work and correlates it all to one end. It may take two years or it may take seven; but, when they go out, their knowledge is fundamental, and their ability is unquestioned. The schools produce but a very few such, but those few go far to redeem the curiously stunted, inadequate system to which the English have thus far adherred.

In Sweden, the specialization of the schools has not progressed so far, but one ceramic institution has arisen. It is devoted wholly to brickmaking. It is modeled closely on the German plan. The students work in a real factory, a part of every day, and do every part of the work until they are proficient in it. They study a little science, physics, chemistry, mathematics and drafting, then application in brickmaking. The pupils are of two groups—young fellows in training for their first jobs, and foremen who leave their jobs for a part of each year to become more proficient. This school does not pretend to create professional men or engineers and is a trade school in the true sense of the word.

The only remaining nation besides our own which maintains definite ceramic instruction is Japan. It is noteworthy that in that progressive and able nation, unhampered by occidental prejudices and traditions, they have been able to pick that which is best in all systems and to build a more ideal plan that has yet been developed in any other nation. The Japanese is teachable—he is willing to learn anything from anybody. Everything that comes to his net he goes over, point by point, item by item. He saves what he thinks is best and rejects all else. Tradition and prejudice seem to have no hold over him. When he decided to break with the traditions of his age-long past, fifty or more years ago, and adopt the western system of science and education, he did so with no reservations, and his amazing progress is the result of this very attitude of willingness to learn from anybody that can teach.

The Japanese ceramic schools, of which there are four or five ,are of two distinct sorts, trade schools and technical schools. Those like Ishikawa-ken and Arita are trade schools —of high grade. Those like the higher technological schools and the engineering college of the Imperial University at Tokio, are of professional grade. The Japanese trade school is more like the German than the English. It gives day instruction, uses all the student's time for his studies, and tries to give him a complete course for the whole industry and not for a subdivision of the industry. It produces highly competent artisans, who can draw, paint, design, model, mold, compound, form, dry, burn and decorate ware. An exhibit will often show the finished handiwork of one person, involving every step of the work, from the design to the glazed and decorated product. The product of these trade schools goes into the industrial system, as non-commissioned officers, and production foremen.

On the other hand, the Japanese break with the German plan and follow more nearly the American plan, in their professional schools. The training given here is of definite duration, and follows a regular curriculum. It is built upon a thorough foundation, involving the equivalent of the high school for entrance. It gives a degree upon successful completion of the course. Its graduates have a rounded and systematic knowledge, not only of their specialty, but of the sciences upon which it rests and can hold their own with Germans or English or Americans.

And now for America! Twenty-two years ago this summer the first ceramic school was organized. Others followed, one by one, until now five distinctive ceramic schools have been organized in universities and colleges capable of granting degrees, and ceramic studies are offered as electives in scientific and engineering courses in at least half a dozen more. In all of these the ceramic training is of professional grade. That is, the applicants for admission must have had a complete high school course or equivalent, and the course in college is four years, and leads to a degree in science or engineering. They all give advanced training in mathematics, physics and chemistry, including laboratory work; and in the engineering schools, they give mechanics, strength of materials, stress in structure, engineering drawing, elementary machine design and elementary surveying, in addition. In all of these American schools the training in the practical side of the art is rather small. Few, if any, American boys graduating from a ceramic school are actually skillful in freehand drawing, painting, designing, modeling, mold-making or any of the actual manual work of pottery making. Most of them have dabbled a little in it, made a few pieces of ware, perhaps, but not enough to earn a living wage in any pottery on the piece-work rate. On the other hand, training in the scientific principles of body and glaze making, and in controlling the technical difficulties of drying and burning wares, is most thorough—not second to that obtainable anywhere in the world.

In America, it is sometimes thought improper to speak of the "gentleman class," and the middle class, and the working class, for the reason that these social grades are not sharply defined here, as they are everywhere else. But it is idle for us to say or think that these classes do not exist in America, for *they do*. The only difference is that here they are not hereditary, and a man may pass from one to another if he can maintain himself there. The old saying that it is only three generations from shirt sleeves to shirt sleeves in America has a good deal of truth in it.

But the product of the American ceramic schools has thus far been designed, consciously and with full intent, for the "gentleman class"—the directing class—the professional class. A man with a college education, representing sixteen years of schooling in all, and the power to think abstractly and concretely, is not going to content himself with a non-commissioned officer's berth—the sergeants and corporals of industry. Much less will he be a private soldier in the ranks—a workman. Every one of these ceramic graduates expects, or should expect, to be a workman for a while, and a foreman for a while, as a part of his preparation for the higher duty of superintendent, manager and owner. But he will not remain in those grades, unless he possesses some fatal flaw in character or ability, which makes him unfit for a place of command.

The question naturally arises, how has this plan worked? Is the ceramic graduate reaching the place on the top shelf for which he was trained? It was my pleasure a year or two ago to make a rather careful analysis of the records of the output of the Ohio school from the beginning up to that time. It would take too long to reproduce the results of that study here in detail, but suffice it to say that the proportion of successful men, holding positions of professional grade was astonishingly high. There was also a large group of men in the second class, but they were very largely recent graduates, or men who had not completed their courses, and who were working through the lower stages, or their probationary period, with every likelihood of ultimately reaching first-grade places. The number of men who had slumped back, or remained workmen, or had failed and quit the business, was small. Every study of every group of collegemen shows some such, but in technical graduates their percentage is small and, in this particular group, was negligible.

Without having statistical data from other American ceramic schools, from what I know of their output, as it comes into competition with our own, I feel sure that the situation is similar, namely, that their men are reaching their mark and becoming the controlling force in the industry.

It is a pleasure to me to contemplate these results, in view of the extremely discouraging reception with which the idea of an American ceramic school was met in its early years. The plan was viewed with distrust and some actual opposition. The early graduates were compelled to fairly fight their way to a hearing or a trial; they had the almost united opposition of foremen and superintendents, when an owner was found venturesome enough to employ one. Every one seemed to assume that the young men knew nothing of real value, and that their "scientific rot" merely made them dangerous in the factory; or, on the other hand, credited them with knowing much more than they did or possibly could. In either case, they were to be gotten rid of, by fair means or foul. But no one can turn back the hands of the clock of progress in this way for any very long time in America. And, as the American college boy is a plucky fellow and a good sticker in the face of opposition, ceramic graduates have gradually reached a recognition and standing wholly different from that of the beginning. It is almost too easy now, instead of being too severe as it undoubtedly used to be.

In every clayworking industry but one is this situation true. In brickmaking, sewer pipe, terra cotta, roofing tile, refractory materials, electric porcelain, wall and floor tile, in metal enameling, in allied industries using ceramic methods like abrasive wheel manufacture, the glass industry and numerous others, young ceramic engineers are gaining positions of trust and authority and are destined to become the leaders at no distant day. In the pottery industry alone, the oldest of all, have they failed to gain much ground. There are notable exceptions here—a few American potteries have ceramic graduates sitting in the front office or in the superintendent's place. But the proportion is wholly different from the other clay industries.

As I see it, there are several reasons which, in some measure, account for this, though they do not justify it. First, the pottery industry is so thoroughly a closed shop—unionized one—that it is very difficult for a young student to go in at the bottom and pass rapidly through the various positions for the purpose of learning the work. Summer vacation work, for two or three months only, can't be had in potteries at all, but can be had readily in other clay industries. So the boy has less chance to make himself competent on the practical side in the pottery industry than in other clay industries.

Second, the industry has originated and been very largely developed by English potters, or those who have gotten their factory training from English potters, and the conservation and tenacious adherence to the old way that characterizes the Englishman in general is well shown here. They will not use technical training in their own country until forced to do so, and they haven't done so here in much greater degree.

Third, potters usually seem to me to assume that they represent the top story of the clay industry—the highest branch of the art. Probably the intermixture of a little more artistic skill in their line than in some others is accountable for this belief. It seems to me poorly founded. Pottery making is substantially a one-glaze, one-body proposition, involving less actual technical skill than many others, where the range of requirement to be met is very much more complex and difficult. Encaustic tile manufacture, terra cotta and electric porcelain are all much more intricate or exacting in their demands, and most clay industries are as difficult of control as ordinary white pottery manufacture. It is this self-sufficiency and idea of superiority which have made the white ware potter the least progressive instead of the most advanced of the clay industries.

Whether my personal views on this matter are correct or not is unimportant, however. The important thing is that the industry still stands as a whole practically where it stood a generation ago, so far as adequate management is concerned; and, while other clay industries are forging ahead and technically educated men are steadily working up towards the leadership, and becoming the controlling voice in these industries, the potters are relatively retrograding. For, one can't stand still in this world—it's either go up or go down; and, if one isn't going up, others are, which puts him relatively down.

The nearest approach to an intelligent criticism of ceramic graduates and of their usefulness to the potter that I have heard is to the effect that the pottery manufacturer doesn't need more men in the front office, but that skilled men at the bench is where he is short. He doesn't want more managers; he wants workmen, competent to do the finer parts of the work, as well as those of Europe do it. He rails at the inadequacy of the American working boy; his lack of ideals, his laziness, his unwillingness to learn a fine art when he can learn a coarse one that pays as well; and finally says to the ceramic schools: "Why don't you fill the gap? Train us skilled operators, and we will bless you. But don't bring us chemists and engineers; we can handle that end ourselves."

I have thought much about this matter—are the potters right in demanding a trade school? I am fully convinced that they are entirely wrong in their rejection of the technically trained man for the front office. I see in the pottery industry many glaring wastes going on, with no effort to check or improve them. I fear that those in charge cannot and will not become the leaders in bringing the industry to a higher plane of efficiency. But, maybe they are right in saying that American conditions do not favor the development of skilled workers from the rising generation.

If trade schools are needed, I certainly feel sure that they should follow the German plan of undivided school duty rather than the English system of working all day in the shop and in the evenings at school. And they should be trade schools, not a mixture of technical and trade training. The difference is profound. The technical man studies primarily to master the fundamental laws of natural science, so that he can apply them to all sorts of cases, and can reason from cause to effect. This knowledge enables definite predictions to be made with safety—how much a beam will stand, how heavy a bridge must be, how fast a wheel must rotate or how much explosive will be required to propel a projectile a given distance. All engineering rests upon quantitative calculations, based upon fundamental laws and properties of matter; and the arduous training required for such work is primarily intellectual.

On the other hand, the execution of practical work requires personal skill—to do the thing in the right way and at profitable speed. All this kind of work may be mastered by attentive children. It does not involve intellectual powers of a high order, but it does require practice and practice and yet more practice. For administration of such work, there is required, besides the manual skill and the exact knowledge of just what is needed, the moral force and strength of character to control others, to see that good work is done and that standards are maintained. These are the qualities needed in the foreman—the non-commissioned officer.

The American character is said to be rapidly changing, by dilution of our blood with too much alien blood and by too much prosperity, which makes our youths dislike to apply themselves with vigor. Whether this premise is true

(Continued on Page 78.)

BRICK FRIEZE, PALACE OF DARIUS.

HERE is an interesting example of ancient burnt clay products, the brick frieze from the palace of King Darius, now in the Louvre Museum, Paris. This frieze, which was taken up, fragment by fragment, and pieced together, shows a procession of archers or warriors. The brick composing this frieze are flat and square and are made of a clay combining the whiteness of plaster with the hardness of stone.

The archers are figured in profile and marching; on their shoulders rest a bow and an immense quiver; they carry a javelin terminating in a silver pomegranate. Their vestments are all cut after the same pattern and are composed of a robe slit in front, of a short skirt with long sleeves drawn in around the waist by a belt, and a round jacket closed over the breast. A rich band of ornament trims the hem of the garments. Some of the garments are golden yellow, embroidered with blue and green daisies; others have a white ground, and bear on a black escutcheon a picture of the citadel of Susa, ancient Elam, Persia. Sometimes the robes are white and covered with flowers and stars set off by a black background; the skirt is black or yellow, the boots gold or blue. Each archer is crowned with a green torsade and bedecked with gold earrings and bracelets. Their skin is black, the eyes are drawn as if they were seen full face, the nose is arched, the lips thin and narrowly edged with carmine. The curled beard is relatively short and curly at the end.

—*Courtesy of Bricklayer, Mason and Plasterer.*

Frieze of Archers, Palace of Darius.

The cuneiform inscriptions on the enamel which concerns the archers still contain, in spite of mutilation and thousands of years of burial and then excavated, the name "Darius King," in Persian, in Median and in Assyrian. These inscriptions, engraved by hand on the edge of the bricks, date their making as of the eighth and ninth century, B. C.

FIRE BRICK IN ARGENTINA.

The principal use of fire brick in Argentina is for setting boilers, evaporators, driers and for all purposes requiring furnaces, the largest users being rolling mills and metal working institutions.

Heretofore the principal part of this fire brick trade has been supplied from England. The annual quantity is about 6,000,000. Of this it may be said that, in round numbers, 5,000,000 has been supplied from England, and both Germany and Belgium have supplied two to three times the quantity that has been bought in the United States. The fire brick prices range from $28.80 to $38.40 per thousand and the usual weight is 7,700 pounds per thousand brick. The trade is usually supplied by brick packed in crates containing from fifty-eight to sixty-eight brick. The most usual English sizes are No. 4, 9x4½x2½ inches; No. 5, 9x4½x1½ inches; No. 6, 9x2½x1½ inches. The principal American products, used largely for setting evaporators, are said to No. 1 arch, No. 1 wedge Hayes run 9 inch and Orvis 9 inch.

BLINDFOLDED BUYING OF REFRACTORIES.

The Laclede-Christy Clay Products Co., of St. Louis, has been turning loose some of the big guns of its advertising talent against the proposition of blindfolded buying of refractories. They have gotten out some very striking literature upon this subject, in which they point that while it seems absurd—the idea of buying blindfolded—many people are doing so by purchasing refractories that are unknown, undeveloped and in a way untried. The demand for fire brick and other products in this class has been very great the past few years and incidentally it has led to the putting on the market of various special offerings in refractory materials, some experiments and some, perhaps, have been experimented with long enough to demonstrate their worth. It is the buying of the unknown and untried in these things that the Laclede-Christy people protest against and make a plea for the standard products of established reputation that have been giving the right kind of service through a long lifetime.

This bit of big advertising recalls to the writer not only that there are a great variety of special composition products offered for boiler furnaces and other furnaces at the present time, but that these things have been offered more or less actively for at least twenty years and perhaps longer.

Back a good many years ago, the writer was talking with a manufacturer of rock wool, which was then a new product and inspecting a plant and its product. The operator of the plant explained that his most difficult problem was to get a refractory material which would stand the intense heat of their rock melting furnaces and also chemical action of this rock wool product when it was in molten form. He had tried many of the special compositions in refractory materials warranted to stand almost everything, but had finally come back to the best quality of fire brick, which, though it had to be replaced from time to time, largely because of chemicals combined with the heat, still served better and longer than any other offering he tried.

The whole proposition seems to resolve itself finally into this: That various compositions may serve certain purposes, serve them better than anything else, but after all, there is no other product in the line of refractories that will serve so many purposes and serve them so well as the right kind of clay burned in the right kind of manner. To state it another way, the best refractory material, like the best building material, is made of burned clay properly selected, blended and burned.

French Flint Pebbles.—Of general interest to the American clayworker, who has used French flint pebbles to any great extent is the following description of how these pebbles are gathered on the French coast. The main territory is around Havre and extends to Dieppe. The flint pebbles are used for two purposes in grinding for ball mill, and as a source of ground flint in the making of pottery. The pebbles are collected by women and children. Prior to the war the prices to pickers was 15 francs ($2.89) per ton for the best flint pebbles, and 5 francs ($0.96) per ton for ordinary flint pebbles. The great amount of these pebbles are shipped to the United States, but in 1915 it was 25 per cent. below the normal. The main reason is that bagging in Europe has risen to such a high price, that it is nearly prohibitive to use it for sacking the flint pebbles.

Written for The Clay-Worker.

BRICK NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

The SEASON STARTED OFF very actively, and for the first few months of 1916 there was greater activity than has been known in late years. Then the effect of the high prices of steel, increases in cement and other materials and difficulties in getting deliveries of different items began to show itself in a reduction of operations. After some weeks of this sort of thing, there are indications of a better activity returning.

The brick and tile plants of the Northwest seem to be having a better business than has been their lot in several years. Some of them are sold up ahead and cannot promise prompt delivery. Others are not sold ahead, but are selling all they make, and are counting upon a lull to allow them to stock ahead for the late fall and winter demand. This latter seems likely to be good, if the crops turn out as well as they are expected to do. By fall the election will be over, and as good Americans, we shall have forgotten our dark anticipations if the wrong man was elected, and will be ready to show that the predictions do not count. It is also quite possible that the Mexican matter will be disposed of and even the European disturbance may be showing signs of cessation, so that commercial activity can be taken up with greater vim than has been possible.

There have been the usual array of labor troubles with the season, though not as numerous. The electricians have caused a little trouble, but the principal grief has been on account of the teamster's strike, which raged in Minneapolis, and interfered with hauling and caused a great deal of trouble. After several weeks, during which there was some violence, it seems to be wearing off, and similar trouble has started in St. Paul.

More interest is being shown in the brick propaganda than formerly, due, in part, to the good work of the Northwestern Clay Association and its prizes for designs for brick dwellings. The contest was handled by the Minnesota state art commission and is the fourth competition of the kind conducted by the commission. The successful entrants in the competition are as follows: First prize, $200, Edward Goralsky, 715 Capitol Bank building, St. Paul; second prize, R. Harrison Haslund, 2417 Clinton avenue, Minneapolis; third and fourth prizes, $125 and $50 (two entries by the same person), Oscar T. Long, 3553 North Upton avenue, Minneapolis; fifth prize, $50, G. E. Wiley and Rudolph Zelzer, 715 Capitol Bank building, St. Paul. First honorable mention, Newton L. Lockwood, 509 Essex building, Minneapolis; second honorable mention, Emil H. Lund, 1100 Donaldson building, Minneapolis; third honorable mention, Lawrence A. Fournier, 3505 North Sheridan avenue, Minneapolis. The jury which made the award was composed of the following well-known persons: William H. Schuchardt, chairman, Milwaukee; Miss Josephine Berry, professor of home economics, University of Minnesota; B. W. Day, architect, St. Paul; A. C. Ochs, brick manufacturer, Springfield, Minn.; Maurice Schumacher, general contractor, Minneapolis. These plans will be published by the state art commission, and will be sold at the cost of making the blue prints. The intention is to give to the home builder, whose means are limited, really attractive architectural service. The plan has worked excellently in the previous competitions, and more plans have been placed in the hands of modest home builders than was ever the case before. These plans have gone to all parts of the world. What has been the case with the wood designs will undoubtedly be the case in greater measure with the brick designs, since they offer an attractive design in a material which cannot be surpassed. These give the answer to the common objection of the great cost. As soon as the commission is ready to send out these plans freely, there will undoubtedly be a big call for them.

The city of Minneapolis has had a number of campaigns for raising funds for different laudable purposes during the past few months. The most notable is that on behalf of the Y. M. C. A. for the purpose of raising $1,000,000, with which to erect a new main building and four branch buildings in different parts of the city. In eight days this sum was oversubscribed and a total of $1,152,000 was pledged. It is regarded as a most remarkable achievement. The need of a new structure was generally recognized. Plans will be drawn soon, and it is hoped to get work under way by fall.

Several large jobs are now under way in the Twin Cities. They include the State Historical Society building, adjoining the state capitol in St. Paul, which is to cost $500,000. George J. Grant Construction Co. have the foundations about in for this building. The shoe factory plant for Foot, Schulze & Co., at Ninth and Robert streets in St. Paul, is to cost $350,000 and is also being constructed by the same firm. Foundation work is just barely started. Brown, Blodgett & Sperry, of St. Paul, are erecting a factory on University avenue, near Wheeler, in the Midway district, and foundation work is under way by the Steenberg Construction Co. In Minneapolis, the Soo Line is building a large grain elevator in the Humboldt avenue yards, and the Thompson Starret Co., of Chicago, has the work, S. M. Klarquist & Son, of Minneapolis, doing the masonry. An addition, to cost $75,000, is upon the foundation work for the Chamber of Commerce, Minneapolis, by the J. & W. A. Elliott Co., which firm also has just taken the contract to erect a nine-story warehouse for the International Harvester Co., at Sixth avenue, North, and Washington.

T. WIN.

NOTES FROM DIXIE LAND.

MIDSUMMER BUILDING at Memphis, Little Rock, Nashville and Central South cities is about normal. Crop prospects are bright and except for a tremendous precipitation of rain during June, there have been no features to interrupt. A considerable amount of remodeling work and some new work, public buildings and modern necessities constitute the main items. The clay industries in west Tennessee and western Kentucky are moving along nicely this summer. The mines are employing full quota of men and carload shipments are on a big order.

A brick school building, after plans by Architects R. H. Hunt & Co., of Chattanooga, is to be erected at Covington, Tenn. This building will be 70x100 feet. It will contain eight class rooms and cost about $18,000.

A building permit has been issued at Memphis for the erection of a two-story, sixteen-room brick veneer residence to John H. Davis, to stand at 57 Belvedere boulevard, and cost $10,000.

J. W. Pumphrey is to erect two handsome two-story brick veneer residences on Central avenue, Memphis, Tenn.

Dr. Percy Wood expects to erect a new apartment in Memphis, to cost $15,000.

The auditorium plan at Memphis was up for consideration at a meeting July 7. Colonel Robt. Galloway had a plan for the city to sell certain property near the railroad terminals to the railroads and use the funds in construction of an auditorium.

A committee of civic organizations in Memphis has been examining sites for the sub-station of the postoffice on Calhoun street, to be built.

The plans for the Memphis hospital of the Southern Methodist Church, to be erected on Lamar boulevard, at the site of the celebrated old Mallory residence, have been made by Architect John Gaisford, of Memphis. The structure contemplated is a very large one, in wings, the present residence, a handsome one, to be left standing for use of nurses.

The old Gaston Hotel at Memphis has been closed, and it is reported that a business structure of modern character will be erected on the same.

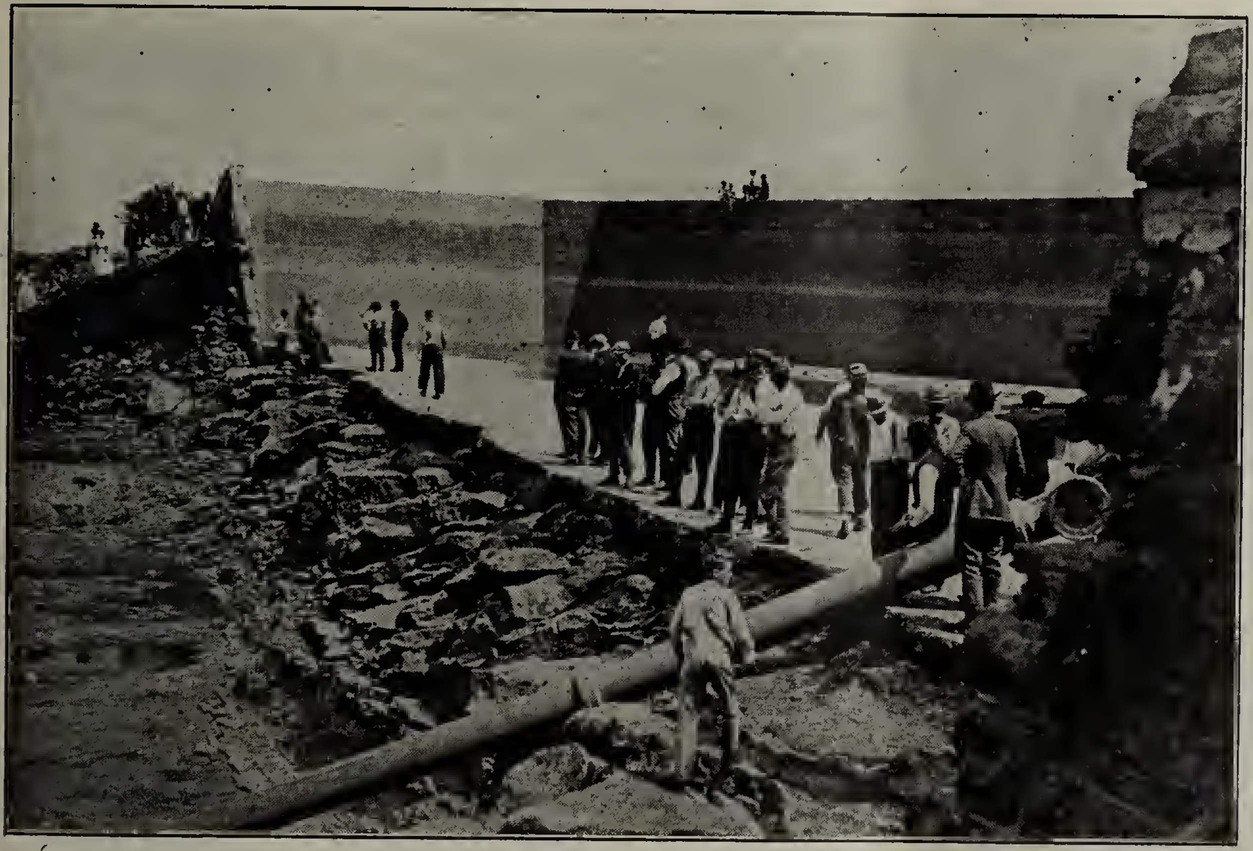
The contract for the new home of the Memphis Overland Company, to be built at Monroe avenue and Lauderdale street, has been awarded to S. Malkin, for $55,000. The building will be 75x163 feet. The plans were made by Architects G. M. Shaw & Co.

Plans have been prepared by Architect Hubert T. McGee for a Methodist church at Friars Point, Miss. Solid brick walls and stone trimmings.

Mahan and Broadwell, of Memphis, have drawn plans for a $20,000 brick and stone Presbyterian church at Brownsville, Tenn. It will be of colonial style, 65x100 feet.

Fred and Jos. O. Pendergrast contemplate the erection of a six-story hotel building at South Main and Calhoun streets, near the Grand Central depot, Memphis.

A two-story, fire-proof brick school house at Hillington, Shelby county, Tenn., is to be erected after plans by Architects Hanker and Cairns. DIXIE.



BEGINS TO LOOK LIKE A SKIN GAME.

Score another "reinforced" concrete collapse. The illustration shown herewith is the photograph of the "remains" of a "reinforced" concrete reservoir at Winfield, Kan., which collapsed June 6, 1916.

The town of Winfield is conducting an investigation as to the cause of the collapse, whether it occurred through faulty construction, the use of faulty material, or if it just naturally tumbled down because of so many failures in concrete structures.

The result of this investigation is watched with interest by contractors and engineers, and, in fact, by all users of cement and concrete.

Moral: To be on the safe side, build with brick.

EXPORTS OF FIRE BRICK.

Our total export trade in clay products ranges in normal times now from about $3,000,000 to $5,000,000 a year. For the calendar year 1915 it was lower than usual, because of war conditions, the total being only $2,704,521.

Now, a peculiar thing about it all is that while this total was the lowest for several years, the value of the exports in fire brick, the biggest single item, increased, as compared to 1914, being $976,479 for the year, as compared to $734,134 for 1914. The banner year in fire brick exports seems to have been 1913, when the total exceeded $1,000,000.

There is a fair quantity of building brick exported, but usually not fore than half the value of fire brick, and the other important items in our exports trade are chinaware, sanitary and earthenware and roofing tile. The total value of fire brick manufactured in the United States runs close around $20,000,000 annually and while approximately $1,000,000 of export is not a great deal, as compared to the total, it is, after all, an item of importance and an item that seems to be growing so that the fire brick item is easily the best clay item in our export trade and this item is becoming one of enough importance in its possibilities of future development to be worthy of some special study.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

BRICKMAKERS are too busy in New Jersey to make news. N. H. Sloan sold 7,500,000 brick in three days recently and his experience could be duplicated in more than one instance throughout the state. Almost any maker will tell you he is so crowded with orders that he doesn't know which was to turn. Of course, his $8.00 or $8.50 doesn't mean as much profit as it would if labor costs and other expenses were down a trifle. But perhaps this is compensated for by the fact that he is selling his output faster than he can make it, and the demand upon him exceeds anything he has seen in recent years.

The story is the same all over the state. Hackensack tells it. The plants in Passaic county repeat it and the Raritan region is so far overflowed with orders that the plants cannot keep up. And this includes every phase of clayworking. All sorts of brick, fire proofing, hollow tile and architectural terra cotta, all alike are sharing in the general prosperity, and architects say they have more work on their tables than they have taken off, so the Eastern brickmaker looks forward to many months of profitable business.

The Hackensack Brick Company, at Hackensack, is working to capacity this season. It had a little difficulty in getting help at the beginning of the season, but it is working smoothly now, and has ample orders to keep it going indefinitely. Buyers take its product as fast as it is burned, and once they have opened a pretty warm kiln.

The Singac Brick Company, at Singac, is doing a capacity business. When the season opened it was difficult to get help because the munitions plants near attracted all the men But one or two minor explosions influenced the men somewhat, and now there is no difficulty. A buyer seeking to secure brick to help tide over a hard place, was told that the firm had none to spare. Everything is all sold, a desirable situation to be in. BURTON.

BRICK HOME BUILDING.

What One Progressive Brick Manufacturing Company is Doing to Boost Building Brick.

BRICK FOR HOME BUILDING is not only the coming thing, and not only can we see that somewhere in the near future practically every modest home as well as the mansion will be built of brick because brick is the best material, but we find that brick home building is very much the order of the day at the present time. There are many beautiful, inspiring examples of brick in the architecture of the home to be found all around us all the time, and more are being added to the list every building season.

The Decatur Brick Manufacturing Company, of Decatur, Ill., realizing this fact, has taken advantage of the opportunity and has made good use of some of these modern examples in brick home building in an advertising way by getting up an attractive illustrated pamphlet on brick construction as compared to frame, in which it has illustrated a number of new, beautiful, modern homes and has given some comparative figures of cost that make valuable as well as interesting data.

Hollow Tile Faced with Royal Rug Brick, Cost 8 2-10 per cent. More Than Bid for Frame.

Just a few selected from the list of homes it has illustrated will serve to give an idea of what it has been doing, what may be accomplished in the way of brick home building and the new home of the present and the future may be made more attractive and desirable and permanent, at very little additional first cost as compared to the cheaper frame construction.

The first example selected is that of the home of C. F. Mattes, in Lincoln Place, Decatur, which is built of hollow tile, faced with royal face brick. This is a bungalow type, and makes a very attractive home. This home figures 8.2 per cent. more built of brick and tile than it would have cost of frame construction. At a glance, one would say that it is easily worth 20 per cent. more. So the builder really got a bargain.

The residence of Frank H. Pahmeyer, on Park Drive, in Decatur, is one that is very attractively faced with brick, a red rug brick having been used of rough texture, with a raked joint of dark chocolate mortar half an inch deep.

The Oak Crest home of Max H. Hurd, which nestles among the trees, is a still more pretentious structure, which is faced with rough texture, rug brick and harmonizes beautifully with the surroundings. The picture of this beautiful home is accompanied by the statement that it figured only 6 per cent. more for brick than for frame.

Another example in bungalow construction—one that is a true bungalow—is that furnished by the home of Thomas W. Samuels, in Lincoln Place, Decatur. This beautiful bungalow home is built of hollow tile faced with the Decatur Brick Manufacturing Company's royal rugs. The brick and tile work on this bungalow was done by the day, and when completed the actual cost was 9.2 per cent. more than the bid received for frame construction. In this instance the brick work is carried to the making of the steps, while concrete and stone seem to feature the porch. This was done perhaps for the sake of diversity, for in many instances it is found that brick is the better thing for all of the porch work except the floor, and really the ideal porch floor is one finished off in burned clay tile.

These four illustrations furnish interesting examples of what is being done today in the way of brick home building. Many other examples, fully as interesting, can be found in almost any community where brick is obtainable for home building, and no better method can be followed for promoting interest in brick and enlarging the use of brick in building operations than by making pictures of and illustrating these examples for the benefit of other prospective builders.

EFFICIENCY IN LITTLE THINGS ABOUT A BRICK PLANT.

At a plant that I visited recently, I was much impressed with the many things that I saw, so much so in fact that I spent the entire day on those works. The plant had been using slack coal with a forced draft of their own design which had considerable merit.

Built with Red Rug Brick with Deep Raked Joint.

The principal unique feature was the drawing of waste heat for the dryer from up-draft kilns and from down-draft kilns, as well as by means of the air ducts that supplied the fireboxes with the blast while burning. There was a system of dampers or valves, by which the blast conducts could be cut off from the blast main and connected to the main leading to the blower that supplied the dryer with hot air. The grates were removed before commencing to draw the waste heat. This seems to me to be by far the best method of getting the waste heat from down-draft kilns and the only one to get it from up-draft kilns.

Another unusual feature that I noticed was the use of preheated air for the forced draft. The air was heated in a steam heater coil that had been used to heat the dryer air at times of scarcity of waste heat; the heat utilized was otherwise a waste.

Shortly before I visited this plant the fuel had been changed from slack coal to a coke oven waste known as "breeze." This was small pieces of coke from the size of sand to the size of a walnut; and as nearly all the coke made is what is known as 72-hour coke, which can only be burned where there is a forced draft. The heat units per pound run very high, and the coke contains very little moisture and contains no volatile matter, which, when distilled and burned, would unite with the oxygen and form water. These latter qualities are fine, especially for use during the water-smoking period. The water-smoking time was reduced to two-thirds the time required when burning coal, and, of course, any time saved during this period made the time of a cycle of the kiln that many days less.

At this same plant I saw burnt brick wheelers wheeling 100 6-pound brick at one load. Now 600 pounds of pig iron wouldn't be as hard to wheel as 600 pounds of brick, as the center of gravity of the load of iron would be considerably nearer a plane that would intersect the wheeler's hands and the point of contact of the wheelbarrow wheel and the wheel iron. At the plant in question the excessive height of the center of gravity was in a measure counteracted by an increase in the distance that the handles of the wheelbarrow were placed, thus giving the wheeler a very much better control over the load. To illustrate the point more clearly, imagine a wheelbarrow with the handles as close together as possible, which would be about 20 inches, only 10 inches each side of the center; with a wheelbarrow of this type, rye-strawed loads would be the rule rather than the exception. Now with wheelbarrows designed rather than made, where the handles are placed 36 inches apart, the wheeler has perfect control of the load at all times. The actual effort of wheeling 100 brick is very little more than in wheeling 75; the time saved will be appreciated by the wheelers, and they will be more anxious to hold their places. The advantage of width between the handles of wheelbarrows was never called to my mind before, until my visit to this plant. A little thought will convince any one that most brick barrows are built with the handles too close together, thus making it exceedingly hard to control a high load, and consequently the load is cut down with its resultant increase in cost.

Rough Texture Royal Rug Brick, Cost Only 6 per cent. More than Frame.

Another thing that I noticed at this plant was the use of ¼x6-inch universally rolled plates for wheel irons. A barrow wheel never touched the ground, or even a plank, except the railroad car floors.

The foreman, quite an intelligent fellow, told me that in buying wheel irons, be sure and get a material that has some spring to it, as they had some that was as soft almost as lead and was not to be desired at all.

The loading was done by the thousand, and each gang had its tally sheet tacked up in each car. The tally sheets gave the car number and initial, the date, the number and kind of brick, and were signed by the tallyman. These sheets were checked by the foreman and pinned with his recount of the load, thus:

12 rows	12 high	40 wide	5,760
6 rows	10 high	40 wide	2,400
2 rows	8 high	40 wide	640
2 rows	6 high	40 wide	480
2 rows	4 high	40 wide	320
2 rows	2 high	40 wide	160
6 rows	1 high	40 wide	240
			Total, 10,000

These were put in an envelope printed on the outside, with the order number, the date, the car number and initial, the number and kind of brick to be loaded. These envelopes were made out with the tally sheets by the office as soon as the empties were spotted, and on completion of the loading the envelope, with its contained tally and recount sheet, was returned to the office and filed away until the final closing of the count.

In event of any claim for shortage or for excess weight by the railroad, the tally sheets being signed as well as the foreman's recount sheet, there was very little chance of the wrong amount being shipped. The company went a little farther and tacked a large card in the car with the following very conspicuously printed: "Don't unload this car until you have checked the count thus." And here followed a copy of the foreman's recount.

Only one claim for shortage had been made since the system had been started.

Since coming home, I have looked up the preheating of the air for burning, and the figures do not show enough gain to justify the expense and the trouble. The specific heat of air is in the neighborhood of .25, and the weight of the necessary 250 feet of air that is required (practical, not theoretical) to burn a pound of coal is 18.75 pounds times the S.P. heat of air, which is .25, gives the heat required to raise the air 1 degree, say 100 degrees, would give a total of 468 heat units saved out of, say 10,000, about 4.68 per cent.

Hollow Tile, Faced with Royal Rug Brick, Cost 9 2-10 per cent. More than Frame.

OBSERVER.

Stoneware Tiles for Sidewalks.—Stoneware is used for a great many purposes, but its use for sidewalks has been restricted. It has been shown, however, that where stoneware tiles have been used that they have given good results. The best adapted sizes are 7½ inches square and 2 inches thick. A good clay which will vitrify at low temperature is the best material to be used for this purpose.—Tonind. Z. No. 25, 1916.

BUILD WITH BRICK

Written for THE CLAY-WORKER.

MILWAUKEE AND WISCONSIN BRICK NEWS.

THERE WAS a decided increase in building operations in Milwaukee during June, which is disclosed by the figures issued by the building inspector's office. During the month there were issued 399 permits, representing an investment of $997,111, as against 402 permits aggregating $829,290 a year ago. This has increased the gain for the first six months of 1916, which is now $1,878,494 over a year ago. The total number of permits to date is 2,020 for work amounting to $6,334,067, as against the last year's figures of 2,092 permits and $4,455,573. The principal work authorized during June was the new $300,000 Miller hotel, which is being erected on Third street, north of Grand avenue. It will be fire-proof, with brick used extensively, even in the construction of the foundation. A brick garage on Mitchell street will cost $25,000, and a brick and concrete apartment at Downer avenue and Webster place is to cost $50,000. There are numerous smaller structures, representing expenditures up to $25,000, which will be of brick or brick and other fire-proof material.

With the building situation holding up well all classes of clay products are in good demand. Contractors are not hesitating about prices, which generally have made a slight increase, but the source of worry is the shortage of labor. Common labor demands a high figure and even then is unsatisfactory, due to better wages being offered here and there as an inducement. With the European war having cut off the immigration, and the return of foreigners to their native countries at the beginning of the war, the labor question has not been satisfactory for some time. But with the increase in industrial activities in all lines the shortage has become acute. President Wilson's call for troops has not generally caused a drain from the building trades, although several thousand men have mobilized at Camp Douglas, Wis., from all parts of the state. However, in case of serious trouble developing from the Mexican situation the call for troops would positively work a hardship on contractors and manufacturers.

Despite the extensive use of concrete in paving in this state, there has been an encouraging increase in the use of brick for that purpose. At Portage, Wis., work will be started this month on vitrified brick pavement. On one street, 22,000 square yards of this style of pavement will be laid. A $35,000 vitrified brick job has been awarded at Washburn, to Thos. E. Wooley, of La Crosse, Wis. The county road and bridge committee of La Crosse county is about to award contracts for paving certain streets in West Salem with brick. At Sparta, bids will be received July 29 for paving various streets with vitrified brick, and work will be started in Grand Rapids on pavement of similar type. The C. Peterson Construction Co., of Kenosha, will do the vitrified brick paving at Stevens Point on three streets. Numerous other municipalities, especially those who have used brick previously, are favoring virtified brick pavement this season.

Due to the materializing of plans for sanitary improvements, the vitrified sewer pipe business is active this season. In Milwaukee, several large contracts for intercepting sewerage systems are being awarded which approach the half million mark. Terra cotta pipe is being used extensively in this work. The Root River Drainage District is to be extended, sixteen drain tile laterals being planned. Bids will be taken late this month, the work requiring about 60,000 feet of tile pipe, from 8 to 20 inches in size. Sheboygan Falls, Wis., is installing a sewerage system in connection with its new water supply and this job requires a large amount of tile material.

Brick veneer on tile and solid brick structures being constructed in Wisconsin are quite numerous. The municipal building at Benton will be constructed in the first mentioned manner. Other buildings of that type of construction include the new Masonic Temple at Milton Junction, and a number of flats and apartment buildings in Milwaukee. An eighteen apartment building on Lake Drive, Milwaukee, will have solid brick walls and tile partitions. Among the solid brick structures are the new parochial school of St. Adelbert's congregation at Superior; parochial school of the Holy Cross congregation, Milwaukee, at Seventeenth and Fond du Lac avenue; parochial school of St. Joseph's congregation, at Waukesha; public school at Ogdenburg. Among the new brick churches to be erected are: First Hauge Norwegian Lutheran, Twenty-seventh avenue and Lapham street, Milwaukee; Grace Presbyterian, Kinnickinnic avenue, Milwaukee; Layton Park English Lutheran, Grant street and Twenty-third avenue, Milwaukee, and the Presbyterian, at Horicon, Wis.

The Wisconsin Mantel & Tile Co., 420 Milwaukee street, Milwaukee, has secured numerous contracts for tile work in connection with residences, bungalows and flat buildings in Milwaukee, Waukesha, Wauwatosa, Greenfield and other places. The terrazzo work on a twenty-eight and a sixteen-apartment buildings at Martin and Astor street, is among the larger contracts secured. This firm also has the tile work in a nine apartment and a store and apartment, Prospect avenue.

The Wisconsin Face & Fire Brick Co., 230 Caswell block, Milwaukee, has secured, among other work, the face brick on a new structure at Watertown, Wis., the rough brick to be furnished by the Acme Brick & Sand Co., 84 Menominee street, Milwaukee.

Hockers Bros., brick manufacturers, whose yards are located between Green Bay and DePere, Wis., suffered a loss of $2,000 recently, when fire damaged a kiln and spread to other buildings. Being situated between the two municipalities, the yards are without fire protection, but relief was sent from Green Bay, the engine using water from the river.

The brick yards of Zerrenner Bros., New London, Wis., were damaged by fire, caused by sparks from a burning kiln. The roof over two kilns and about twenty cords of wood were burned, causing a loss of about $600. The fire department from that city responded, but difficulty was encountered in securing water. There was plenty of water in the old pit, but the hose soon became clogged. The loss is not covered by insurance.

The resignation of William Meadows as secretary, treasurer and general manager of the Burlington Brick & Tile Co., at Burlington, as mentioned in the last issue of The Clay-Worker, was not accepted at the special meeting of the stockholders of the company. Instead, the stockholders decided to grant him a leave of absence of as long duration as he wishes. During the absence of Mr. Meadows, the office will be in charge of J. J. Marquis and the general management will fall upon Henry Storey.

J. F. Kies & Son, M. & M. Bank building, Milwaukee, have established a warehouse at Thirty-first and Lloyd streets, to facilitate the handling of tile products and enable the firm to carry a supply in stock for immediate delivery. The firm also deals in brick and other clay building products. Reports of brick business in all lines are made by this firm.

A. BADGER.

FOR BETTER OR FOR WORSE.

At the end of six weeks of married life a southern darky returned to the minister who had performed the ceremony and asked for a divorce. After explaining that he could not give divorces, the minister tried to dissuade his visitor from carrying out his intention.

"You must remember, Sam, that you took Liza for better or for worse."

"I knows dat, boss," rejoined the darky; "but she's wuss dan I took her fer."

ANNUAL MEETING OF THE AMERICAN SOCIETY FOR TESTING MATERIALS.

There was the usual good attendance at the yearly gathering of the American Society for Testing Materials, held at Atlantic City, June 27 to 30. Committee C3, having in charge the classification of building brick, reaffirmed the action previously taken, but agreed to certain minor changes, which will be incorporated in next year's report, which will probably be final. Professor Edward Orton was re-elected chairman of the committee and Professor Albert V. Bleininger was re-elected secretary.

The committee having in hand the standardization and tests of drain tile, of which Professor Marston, of Iowa, is chairman, reported progress, and will probably adopt a complete report a year hence. A record of a series of tests by freezing and thawing was submitted, by which it appears that clay tiles are more dependable and less liable to injury from frost than tile of other materials. Those desiring specific data in these matters should communicate with the chairman of the committee direct.

An incident of the social phase of the gathering was an aerial flight by Professor Orton, who took a trip in the hydroplane, getting a view of the city and coast from an altitude of 1,000 feet or more. It was a very delightful experience, he said. He was also much pleased by the advice that his application for admission to the Plattsburg Military Camp had been accepted. It is his plan to spend most of August and part of September there.

Another pleasing incident was a fishing trip, in which Will P. Blair, of Cleveland, proved the star performer. He caught more fish and got more out of the trip than anyone else in the party. For a full bill of particulars, we must refer our readers to Mr. Blair himself, but the above brief statement of facts will be corroborated by Professors Orton and Bleininger. Atlantic City is certainly an ideal place for a summer convention. Professor Ross C. Purdy has pronounced views on this subject, which are concurred in by Leo Child, Findlay, Ohio; Charles Rawson, Des Moines; George H. Tefft, Kansas City, all of whom were in attendance and know whereof they speak.

AN EPIDEMIC OF LABOR TROUBLES.

'Twould seem from reports from all sections of the country that there is an epidemic of labor trouble, due in a large measure, no doubt, to the unusual demand and high wages paid by the munition factories and others manufacturing war supplies of all sorts. There certainly is a scarcity of labor. Many of the brick plants of the country are finding it difficult to operate to full capacity on that account. This should bring home to them the advantages of employing labor-saving machinery and appliances in all the various branches of brick and tile making. In drying brick and tile, labor and trouble may be minimized by the standard equipment furnished by the National Dry Kiln Company, of Indianapolis, whose ad will be found on page 90 of this issue. They will be pleased to give the whys and wherefores to any reader of The Clay-Worker who will write them for same.

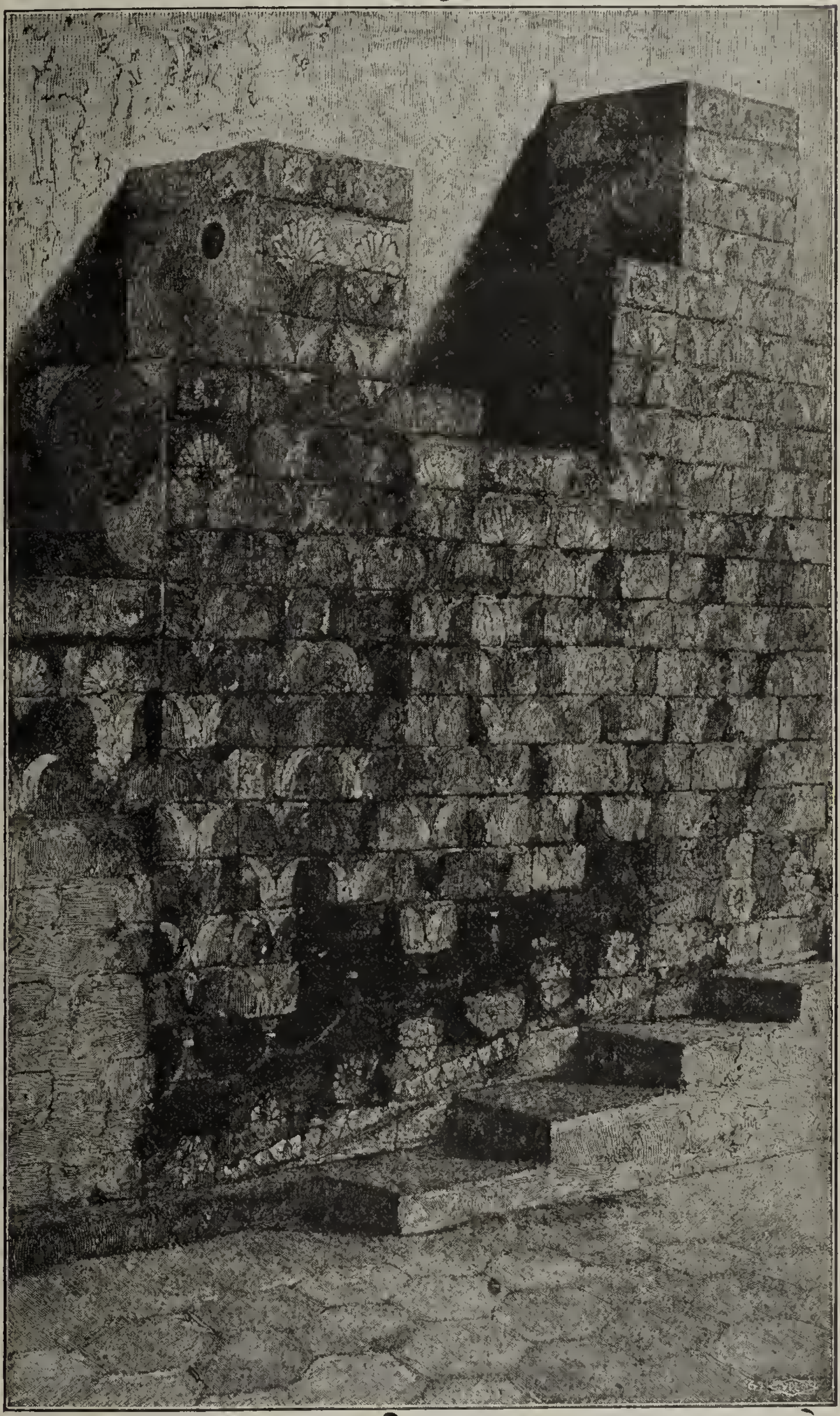
BLAST RIVER BED WITH EXPLOSIVES AS A MEANS OF OPENING UP NAVIGATION.

The citizens of Muskegon, Mich., had a lively Fourth of July. They had noise and excitement without a waste of effort. A ton of nitroglycerine was placed in the old bed of the Muskegon river channel at Muskegon and exploded between 10 and 12 o'clock. A number of prominent citizens of the city and state, as well as transportation officials of all lines entering Muskegon, witnessed the work, including Governor Ferris. The purpose of the blasting was to open 50,000 acres of the most fertile land in the state by providing means of transportation.

BURNED CLAY PRODUCTS--THE EVERLASTING BUILDING MATERIAL.

Enameled Brick Staircase, Susa, Ancient Elam, Persia.

THE ILLUSTRATION herewith is that of the grand staircase of enamel in the palace of the ancient King Darius, about nine or ten centuries B. C. The Susian people who built this palace were an isolated race and considered the most ancient colonists of Asia. They were those blacks of the Rig-Veda, those Ethiopians of the Levant, mentioned by Homer and described by Herodotus.



Enameled Brick Staircase, Palace of Darius.

The palace of Darius, excavations have shown, rose to an almost rectangular platform sixty feet high and was surrounded by fortifications. The illustration shows but a small part of this magnificent but gigantic staircase, which led to the throne room. The fortifications comprised, first of all, a moat filled with water. The exterior rampart, built of hollow brick, was seventy-five feet broad and seventy feet high. A second rampart, fifty-seven feet broad, formed by two unbaked brick walls eleven feet and fifteen feet thick, had an earth filling between them.

Written for The Clay-Worker.

FLASHING BRICK.

BY ANTON VOGT.

Shale and Fire Clay Brick—Suitable Kilns for Flashing—Perforated and Semi-Solid Bottoms—When to Start to Flash—Manipulation of Draft—Falling and Rising of Temperature During Flashing—Cooling of Flashed Brick—Shades Produced.

THERE IS AN OLD or trite saying, "Any color, so it's red." This might easily have originated with the brick business, for from time immemorial, ever since man first molded clay into brick and burned them, the generally accepted color of building brick was red.

Red was paramount, and the burners had instructions to be careful, so as not to flash the brick or discolor them in any way during the firing of the kilns.

But in the last few years this has changed. Now red is getting too common; people demand something different, not only in color, but also in texture. Formerly the demand was for smooth brick; now they want them rough, and brickmakers can't make 'em rough enough. They want the brick flashed, too; painted, we might say, with fire; and beautiful effects have been produced in the kilns; but the trouble has been that the same effects could not always be reproduced. The burners did not always know how they did it. They either had no means of telling or neglected to keep records of how much heat they had and how much draft on the stack. They had nothing to refer to, to insure getting the same results every burn.

Since the public demanded better and harder brick, the brickmakers have taken notice and improved the burning, installing modern kilns, by the use of Seger cones and electric pyrometers, by using draft gauges and apparatus to ascertain the character of combustion, producing at will oxidizing or reducing conditions in the kilns and keeping records of every kiln.

Flashed brick are finding favor with builders everywhere; the common red seems to be too common.

Shale for Flashing Brick.

A shale that is free or very low in alkalies is naturally best for flashing, as such shale easily takes a fire glaze, owing to the general proper proportion of silica and alumnia, and being free or low in alkalies. But, in order to stand up under the heat, a shale suitable for flashing must have a wide range between vitrification and fusing or softening. Shale free or low in alkalies always has a wide range between the two points mentioned, and is therefore a safe shale.

If the margin between these two points, vitrification and fusing, is too close together, it's rather risky to undertake the flashing of such brick, unless under the care of a careful, experienced burner—one who knows more than only how to shovel coal or turn on the oil or gas. He must, by all means, know something about the chemical changes taking place in the kiln under oxidizing or reducing conditions. He must know what is what, and why.

Clay or Shale Which Whitewash, and How to Burn Off the Whitewash.

While the whitewash can be burned off with a soaking, sweltering heat, it takes extra time, labor and fuel, and often is extremely risky. Such clay and shale to be burned economically and safely should be treated with carbonate of barytes, neutralizing the effects of the stuff that causes the whitewash. Then it can be burned with a profit; but when one must burn off the whitewash, he also burns off the profits.

Fire-Clay Brick for Flashing.

With this material we can produce a variety of flashing effects, according to the iron contents of the clay, resulting in from a few to numerous specks or blotches, with many different colored backgrounds, from light buff to dark and gunmetal.

The risk of flashing fire-clay brick is not great, owing to the general wide range between vitrification and fusing. Only the No. 2 fire clays are used for flashing; the higher grades have not enough iron, and one would have to burn up the profits in burning far enough to flash. Therefore, sometimes, where only high-grade fire clay is available, it is mixed with common red burning clay, thereby reducing the refractoriness of the high-grade clay and making the mixture suitable to flash at a lower heat, costing less per thousand brick. In these days of competition, costs must be reduced in all directions.

It's different in the clay industry than in the cattle industry. For instance, in the cattle industry, breeders claim they can reduce cost of production by breeding high-grade stock to common stock. They figure it costs no more to feed an improved breed than it costs to feed an inferior one. In the clay industry it costs more to burn a high-grade clay than an inferior one, and therefore we make the high-grade clay inferior, with the addition of common clay, and so reduce cost of production. It's queer, but, nevertheless, it's a fact.

Kilns Suitable for Flashing.

From our past experience we know that perforated bottoms in kilns give better results than solid-bottom kilns. Next in line come the so-called semi-solid bottom kilns, part solid and part open. Many have tried to flash brick in solid-bottom kilns, with a flue in the center and stack flues leading to the stacks in the kiln wall, such as they have in the 'Gas Belt" of Kansas.

My own experience there, and from what I have seen in other places, have convinced me that brick in such kilns cannot be flashed to the bottom, the flash being mostly on top and on the sides. We cannot flash brick in solid-bottom kilns through the center and from top to bottom, any more than we can burn and glaze sewer pipe in them. Who ever saw a solid-bottom kiln for burning sewer pipe?

Setting Brick for Flashing.

Brick for flashing are set on the flat, so as to expose the faces to the reducing fire during the flashing time.

Fire brick can be set five deep or more, but shale brick should not be set more than three deep, and they must be well sanded, to keep them from sticking and consequent warping.

The bag walls of the kilns should be low, just a little higher than the arch of the fire holes.

When to Start to Flash—Flashing with Coal.

When the burner has the settle to within two inches, he should reduce the draft, so the fires just draw in, no more; and fire without any air over the coal, thereby creating a reducing atmosphere. How often should he fire? As soon as the smoke clears from the top of the stack, he should fire again, but he should not fire heavy. Fire often until trials show the desired flash.

Manipulation of the Draft.

By firing twice with reduced draft and the third fire with full draft, firing alternately reducing and oxidizing will produce various effects in color. The aim should be to maintain a reducing atmosphere in the kiln, and not let the oxidizing conditions last long enough to supply oxygen to change the ferrous iron, produced by the reducing fire, into ferric iron.

As the word "flash" means, we must create smoke and flame in the kiln, with imperfect combustion, which we can get easily by reducing the draft and closed fires.

Mottled brick can be produced from fire clay that contains pyrites of iron; and if these are not present in the clay, we can supply them by the addition of manganese in powdered form for the background and in granulated form for the specks, small or large, as desired; but it's not so easy, as some suppose. Manganese only develops with high heat, and it takes some practice to become an expert for flashing brick with natural or artificial means.

Flashing with Oil.

In using oil for flashing, we have found that the best results can be obtained by letting the heat go down about 100 degrees after the maximum heat, that the clay will stand, is reached. Then turn off nearly all the steam and turn on more oil, just enough to atomize or spray the oil. We then create reducing conditions, just as with coal; we have imperfect combustion, and the smoke will roll out in great volumes out of the stack. When the heat again reaches the degree we had, when cooling the kiln before starting to flash, we again let the kiln cool about 100 degrees, and repeat until we have a satisfactory flashed trial on the bottom of the kiln.

As the heat from oil is more steady than from coal, we must be careful not to overheat the kiln on top and on the sides.

Flashing with Gas.

Proceed the same as with oil, reducing the draft, and cool and heat the kiln as with oil.

A draft gauge and a pyrometer are indispensable in flashing brick. Good results cannot be obtained by guess work.

Cooling of Flashed Brick.

After finishing a kiln of flashed brick, the way that sewer pipes are cooled is as good as any; the main thing is to open up the fire holes and the openings in the crown, and when the fire holes change to a dark red, give back-draft by letting the damper down at the stack and taking the manhole plate off; then, as the fire holes get dark, close them up with ashes, and when the brick in the kiln have changed from the red to dark, open the door gradually, having the top in the crown open only very little, the center hole about two inches, and the side holes about an inch. A little practice will tell how fast flashed brick can be cooled; being nearly vitrified, they are liable to air-check, just like sewer pipe, if they are not cooled properly.

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CO-OPERATION IN BUILDING CODE WORK.

While there is some competition and natural rivalry among brick, concrete, steel, gypsum and other hard or incombustible building materials, there are some lines of work in which they should join forces and co-operate for the common good of all.

Take, for example, the matter of building codes. Practically every city of any magnitude is striving to modernize and modify its building codes to insure not only safe building structurally, but especially to safeguard districts against disastrous fires.

In seeking for ideas for amending building codes, they naturally turn to those who have fireproofing material for suggestions. Now, just so long as each interest seeks to promote only its own product, the suggestions will be incomplete and more or less conflicting. The concrete people will advise the things that are of particular interest to the concrete industry, the brick people will suggest provisions to take care of the brick and clay products, the gypsum people will advance ideas that have direct connection with their own product, and so it will go.

Really all these industries, including not only those mentioned, but steel and various products, should confer among themselves, so that when either is called upon to give advice the advice will be in effect standardized, and each will offer the same. They will not confine their advice and suggestions merely to what interests them, but will cover the matter in a broader way and include a consideration of all the fire-resisting building material.

If we can get together in this way and co-operate, with the object of making uniform suggestions or specifications, it will not only simplify the work of those undertaking to get out new building codes, but the advice will have more effect, because of its uniformity and coming from many different sources. The people in charge of the welfare of city building in all parts of the country are thoroughly aroused upon the subject of eliminating fire waste as well as safeguarding the people against the danger to life in the disastrous fires, and there never was a time in the history of the country when conditions were better for getting written into building codes specifications calling for fire-resisting building material. We can get the most out of this opportunity by co-operative effort among those engaged in the manufacture and handling of the different fire-resisting materials; and, while there may be some natural rivalry, we should lay this aside and all get together on the proposition of building codes advice.

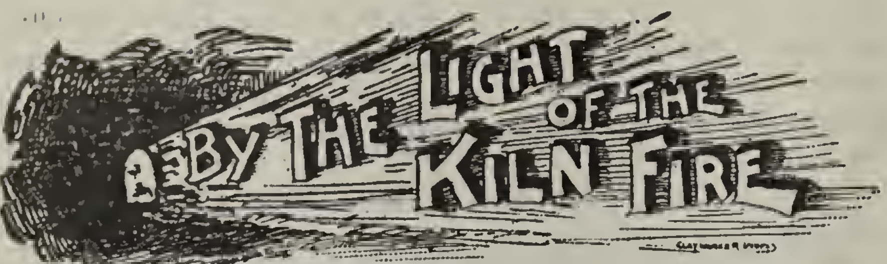
Another line of work suggested that needs serious consideration is that of co-operative work with underwriters and those in charge of making insurance rates and regulations. The insurance people, like the building code people, are anxious to have their regulations scientifically correct and to reduce the fire hazard wherever practical. Also where they can do this, they are willing to reduce the insurance premium in proportion. A proper educational campaign along this line should result in getting enough favorable difference in insurance cost to become quite a factor in inducing the public to build with brick and other fire-resisting material.

The Bureau of Standards is doing some good work along both these lines, and here again is a place that there might be some co-operation among brick, concrete, steel, gypsum, etc., to the end that the issue may be clarified instead of muddled for the Bureau of Standards, and proper and satisfactory standards set forth clearly to guide everybody interested in the matter.

In short, there is room for some good team work that will assist materially in boosting all fire-resisting material, and we hope to see the trades in this line bury the hatchet of business rivalry to the extent of getting together occasionally and discussing the things in which all are interested, to the end that we may have an effective working agreement and simplify the matter of setting our product before the authorities and people at large without the confusion of cross and counter claims.

POTTERY INDUSTRY HELPED BY WAR.

According to the United States Geographical Survey, the pottery industry in the United States made considerable progress in 1915 compared with 1914, the value of the output being the largest on record with the exception of 1913, when the Republican tariff law was in operation. In common with all other manufacturing industries, the pottery trade felt the blight of the Underwood tariff law. The war has served the purpose of a protective tariff, and imports of pottery for 1915 were 21 per cent. below those of 1914, while exports of pottery to supply the wants of the countries no longer able to secure it from Europe have increased about 30 per cent. But if there is one class of workmen in the United States who know better than to attribute this prosperity to the Democratic party, it is the potters. These workmen have made an intensive study of the tariff and its effects on their industry, and they can all give Democratic congressmen cards and spades when it comes to the pottery schedule.


BY THE LIGHT OF THE KILN FIRE

PHILOSOPHY IN THE CLAY PIT.

Brick Flanagan Seeks Dignity.

All questions and problems are simple when once we understand them properly. And yet, it is some of the simple-looking questions, like the small-appearing incidents of life, that cause the most worry and trouble and are hardest to understand. Take the case of Brick Flanagan, for example, and his well-aimed but misdirected efforts to find the key-note to dignity—and play on it—and we have—but let us take it and let it show for itself.

Brick was curled up in a wheelbarrow like the first quarter of a growing moon, silhouetted dimly against an impressive background banking of a row of brick kilns, smoking and steaming at the top and twinkling in the dark at the fire holes. It all made a soft and broken darkness into which the outline of Brick and the barrow fitted as if the whole scene had been painted by a master hand. The delicate touches of finesse were there in the form of a partially bald head, partially surrounded by a crescent of sandy hair, and the inevitable short-stemmed clay pipe. The picture is indelibly impresed mentally, and still remains undimmed, but the central figure was disturbed at the time with a—

"Hello, Brick! What's keeping you out here after bedtime? Are you afraid to trust the kilns to the boys alone?"

"'Tis not the kilns, and 'tis not the boys that be keepin' me awake and wor-rkin me pipe overtime this night," said Brick, coming to from his meditations, "but 'tis a question I'm seekin' the answer to, an' 'tis a riddle I'll be askin' yez to solve if ye don't mind. What is dignity? An' where does a fellow get it an' how does he use it whin he does get it?"

The counter question of the strangeness and the whyfore of this question from such a source, at such a time, was not asked—it was looked, and looked so plainly that it started Brick off to telling all about it.

"'Tis like this," says Brick, starting off slowly and thoughtfully, after pulling heavily at his pipe a moment or two. "Whin I wint down to the office with some clay from the second opening on Blue Hill for Mr. Phil to analyze—it's young Phil, the boss' son, yez understand, him as wint to college up to Columbus where they learn brickmakers' sons that clay is made of some sort of chimicals, an' since he's come back it's a regular chimical labratory he do be havin', an' always askin' for clays, analyzin' thim an' ixplainin' things. Some divil's imp got into the noodle of me, an' whin I takes Mr. Phil his clay, I sez, sez I:

"'Mr. Phil, it's great yez are at analyzin' an' explainin' things,' sez I, 'an' now can yez analyze an ixplain me this: Why is it yez fayther is rich an' owns the works an' don't have to work, while it's meself can make better brick an' more of thim than yez fayther iver could, an' that come here with him these twinty years gone by, an' still don't own no works, but has to work? Can yez answer me thot?'

"'Perhaps,' sez Mr. Phil, 'it was some matter of money an' wise invistment.'

"'Money, sez I; ''twas meself that lint yez fayther me own little nestegg to buy his first claybank with, an' 'twas meself that made the brick and thin burned it while yez fayther was huntin' of some place to sell it.'

"Thin Mr. Phil got to lookin' serious, like he does when he finds somethin' in a sample of clay or a test brick that they didn't teach him the answer to up at Columbus, so that he has to find it out for himself.

"'Niver mind, Mr. Phil,' sez I, 'an' don't go to wor-ritin' any about it, for it's not gru-umblin I am, but just wonderin,' an' yez have learned me so many new ways about brick burnin' that I thought maybe yez could answer that puzzle for me. If yez raymimber, yez often sez that all things that puzzle us is made up of simple ilemints an' it's just a matter of gettin' at separatin' the ilemints!'

"But Mr. Phil kept lookin' worried an' mutterin' to himself, an' bye an' bye he tells me to wait there for him, an' he goes into the private office an' has a session with the boss. I couldn't hear what's bein' said, only now an' then a word, like when the boss sez somethin' about it bein' Brick havin' one of his jokes. But Mr. Phil he keeps serious and finally he gains his point, for I hears the boss tell him to go ahead an' have his way thin. Mr. Phil, he comes back to me thin, lookin' pleasanter, an' he sez to me:

"'Brick,' sez he, 'I judge from yez question that yez have a sort of lurkin' ambition to be a factor in the business an' not just a worker with yez hands. I'm goin' to give yez a show, for I think yez are deservin' of it, but the answer will rest with yezself. All I can do is give yez a hint to point yez in the right direction, which same hint is a part of the answer to yez puzzle, and that is one reason why you have not been put in a commanding position heretofore is a lack of dignity on your part. Superiority is largely a matter of dignity, an' with this hint I'm goin' to try you as foreman over the digging crews as a start or steppin' stone to what you want. The rest is up to you—report for your new duty tomorrow.'

"'What the divil—' I started to, but I didn't say it. 'Brick,' sez I to meself, 'it's up to yez to stop wor-ritin Mr. Phil an' learn a few things fur yezself.' So I goes home an' sneaks a look at the dictionary what I bought for the childer when they wuz gettin' along up in school, and here's what it sez: 'Dignity—The state of being worthy or honorable; elevation of mind or character; nobility of sentiment, etc. * * Quality suited to inspire respect or otherwise; loftiness and elegance; impressiveness—said of manner, style, etc.'

"That was the answer the big book give, but it didn't learn me the things I wanted to know—what I must do an' how I must do it to be what Mr. Phil calls more dignified. So I turns to me favorite place of self-communion, furninst the kitchen stove, kicks off me shoes, lights me pipe an' starts in to think it out like I does when some new clay rayfuses to bur-rn right in the kilns. But me meditations is interrupted by Bridget. She comes in an' eyes me wid one of thim looks that make me guess if she's goin' to start throwin' things or jist handin' me a few wor-rds.

"'Worry me not,' sez I, beatin' her to it, 'fur 'tis more trouble I have on me mind now than a cavin' arch in a bur-rnin' kiln, an' furthermore,' sez I, 'if yez want to be a helpmeet to yez husband indade as well as in name, jist yez tell me how to be more dignified.'

"'Tell yez—Brick, mon, what ails yez?' says Bridget, lookin' now like a hen that's hatched a duck an' sees it jumpin' in the water.

"''Tis Mr. Phil,' sez I. 'He's fur promotin' me to foreman furninst the diggin' crew, but he tacks thereon a proviso that I must wear more dignity.'

"That wor-rd wear gives Bridget an idea, jist like it will any faymale, an' thin, similar like, she gits herself another idea before she kin work on the first, an' she sez to me:

"'Man does not get dignity sittin' by his wife's cookstove in the kitchen an' smokin a black pipe,' sez Bridget. 'It's dressed up, sittin' in the parlor smokin' a black seegar yez should be.'

"''Tis more comfortable an' natural like here,' sez I.

"''Tis not comfort yez are seekin', sez she; 'nayther is it comfort an' dignity that hitch up togither,' an' in the ind she had her way, as a faymale will, an' made me wash an' dress up, but, raymimberin' it's Tim Haggerty's night to come courtin' Katie, Bridget gets herself a grip on that first idea. an' it's uptown shoppin' we go.

"'Tis clothes that do a lot to make dignity,' sez she, 'an' were it not so Eve would have been the most dignified of the sex.' An' with that she leads me onprotestin' to turnin' me wages over to the storekeeper till we comes to some striped garments that I'm knowin not the use of, nayther do I like the color.

"'Thot's not to me likin, whativer it is,' sez I, 'an' I'll not be givin' up me wages for the likes of it.'

"It's pajamys," sez Bridget, 'an' it's buyin' 'em you'll be if you like it or no, an' slaypin' in thim, too, for no man of dignity sleeps in his wor-rkin' clothes, an' it's helpin' yez to be a man of dignity yez do be askin' me.'

"'Tis more like a clown yez will make me,' sez I, but Bridget has her way, as faymales will now an' then.

"An' thin, whin comes the mor-rnin she has laid out more toggins than I has on me widdin' day, an' she meets me with a smile that looks all swaytness, but which says plain as talkin', yez is goin' to put on the glad rags, me dear, an' if yez don't it's things you'll be hearin' that'll make ye wish yez had. An' me, forgettin' me manhood an' that I am me own boss an' the legitimate head of me family, because I'm that crazy lookin' for this dignity thing, I takes the bait meek as a lamb, dons the new harness of dignity, plug hat an' all, an' starts out.

"I see the boss gives me a look as I was goin' over to the clay field an' meets him on the way to the office. He stops an' acts like he's goin' to ask me about it, thin he thinks better uf it an' goes to the office lookin' for Mr. Phil, an' I goes on to me job feelin' a bit ner-rvous an' fretful, which same feelin' is not improved whin I see the boys lookin' at me an' thin grinnin' slyly to each other. But I holds in till Jimmie Sullivan looks up an' says:

"'What's on, Brick,' sez he, 'are yez goin' to a funeral after ye shows us how to do what we alreay know how to do?'

"'I'll be star-rtin a little funeral, wid yourself in the middle uf it if yez don't belay yer jaw,' sez I.

"'Oh, I guess not, not wid all them glad rags on, anyhow,' sez Jimmie, 'for 'twould be a shame to git them messed up.'

"Thin they all laughed, an' whin they did thot I sailed in, forgittin' clothes an' all, an' 'twas a glorious ruction, too, with me fightin' like a mad bull an' a whole dozen of 'em jist tantalizin', laughin' an' gittin' out of the way whin they could, an' gittin' a lick whin they couldn't. But about the time I was enjoyin' meself an' for-rgettin' all about wantin' to be dignified, Mr. Phil comes along an' calls a halt. After the other boys had dropped back out of my way, an' I was noticin' the distur-rbed condition of me clothes, Mr. Phil gives me a cross-question look an' sez:

"'Brick,' sez he, ''tis not dignified to ingage in a rough an' tumble brawl wid your fists,' and wid that, after givin' us all another hard look he turns an walks back to the office."

With that Brick paused in the recital of his troubles, struck a match, lit his pipe and puffed away in thoughtful silence, until impatience for the rest of the story took the form of an inquiry if that was the end of it.

"'Tis not the ind," Brick replied. "The ind is what I'm after lookin' for an' askin' yez about. 'Twas all that was said thin, but that was just the day, an' Mr. Phil has been leavin' me alone to find the answer fur meself. Bridget is now br-rushin' up me fine toggery agin, an' meantime it's meself that is here wor-ritin about it an' seekin' the answer to what it is constitutes dignity, where does one get it, an' how does he use it whin he does get it? Can yez answer me thot now?"

After thinking the matter over carefully, I concluded that I could not give the answer he wanted in plain, understandable language. Can you?

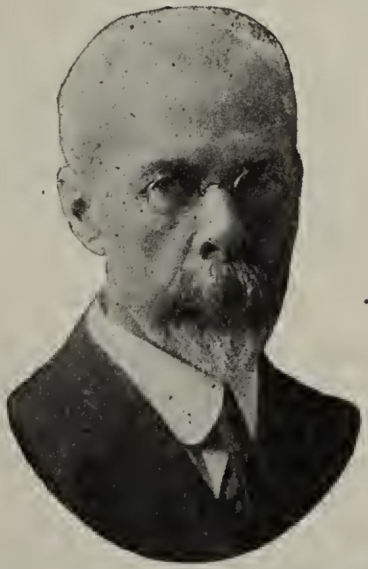
CERAMIC STUDENTS AMONG GRADUATES OF ILLINOIS STATE UNIVERSITY.

At the commencement of the University of Illinois in June, 222 baccalaureate degrees were granted to students of the College of Engineering, distributed as follows:

In Architecture	27
In Architectural Engineering	36
In Ceramics	10
In Ceramic Engineering	5
In Civil Engineering	39
In Electrical Engineering	43
In Mechanical Engineering	44
In Mining Engineering	3
In Municipal and Sanitary Engineering	5
In Railway Engineering	10
Total	222

HONOR FOR PROFESSOR BINNS.

Professor Charles F. Binns, director of the New York State School of Clayworking and Ceramics, Alfred, New York, has been awarded the "Special Honor" in Pottery for a collection of stone-ware vases exhibited in Washington, D. C., at the Industrial Art Exhibition on the Federation of Arts. Professor Binns has been engaged for some years in the development of these wares, but the fifteen pieces exhibited are nearly all new.



Prof. Charles F. Binns, Alfred, N. Y.

NEW INSTRUCTOR IN CERAMICS AT ALFRED.

Mr. Joseph B. Shaw, ceramic engineer, of Pittsburgh, Pa., has been appointed professor of ceramic engineering in the New York State School of Clayworking and ceramics, at Alfred University. Mr. Shaw will take up his residence at Alfred in September.

The Shawmut Paving Brick Works, of Shawmut, Pa., and the Pennsylvania Clay Company, of Pittsburgh, Pa., have become licensees of the Dunn Wire-Cut Lug Brick Company. The Shawmut Company has an approximate daily capacity of 30,000 paving brick, but the company is contemplating the enlargement of the plant to a 50,000 daily capacity. The Pennsylvania Clay Company has one plant at Conway, Pa., with a capacity of 60,000; one plant at Crows Run, with a capacity of 60,000, and one plant at Bradys Run, Pa., with a capacity of 40,000. The acquisition of these two companies gives the Dunn Wire-Cut Lug Brick Company thirty-two licensees, operating fifty-two plants.

PUBLICITY MATTER FOR DRAIN TILE MANUFACTURERS

The following article, which appeared in the Indianapolis News, June 30, is reprinted in full with the idea of offering to the drain tile manufacturers of the country a bit of publicity matter they can present to their local or county papers for publication.

SEVEN HUNDRED BUSHELS OF ONIONS TO THE ACRE RAISED ON TILED LAND.

Remarkable Example of the Benefits of Underdraining Shown in Marsh Lands of Marshall County, Ind., Where Swamps Have Been Converted Into Fertile, Money-Making Farms.

By James E. Randall.

SEVEN HUNDRED bushels of onions to the acre at 40 to 70 cents a bushel on the ground, that's what tile underdrainage did for us here, where six years ago we were wading through the marshes in boots hunting for pheasants."

This was one of the expressions of the superintendent of the N. W. Erickson farm, Polk township, Marshall county, Indiana, during a conversation recently when walking over his onion-covered fields.

This farm is four and a half miles southeast of Walkerton on the old Laporte road, an old Indian trail known as the "Old Yellow River Road." It is only one of many farms built up out of the marshes and is not the exception, many of the other farms in that region being larger producers. It is situated in the onion district of the state, where millions of bushels are produced annually from the land reclaimed from old swamps and marshes.

Secret of Success.

Tile underdrainage—that is the secret of the whole affair—it could be spelled "hole" with equal propriety, for before the tiles were put in this was a water-soaked region and you were apt to sink up to your knees in hole after hole if you wandered any distance from the beaten path.

Three years ago you couldn't get a team out without bog shoes; it was regarded "mighty poor farm land" and a decidedly unhealthy place in which to live. Not so today.

The knowledge of a few simple facts and the nerve backing up conviction made this great change possible. Much credit is due those men who have turned their marsh lands into rich farm lands. It took real nerve and it required great perseverance to grub this section, clear it of its useless brush and undergrowth and to prepare the way for drainage.

Once the tiles were laid, the foundation for great returns was certain. The tile did the work, the excess water was removed and the rich soil, buried or hidden away for ages, stretched out in the sun, where it could take on new life. With the removal of the water the unhealthy conditions disappeared, and this former mosquito-breeding region became a delightful place to live in.

All Successful Farms Tiled.

If there are any persons on the face of the globe that are enthusiastic supporters of tile underdrainage, it is the people of Marshall county, Indiana. All the successful farms in that part of the country are tiled, even the farms with high, sandy soil, for tile drains render also a higher service than simply the removal of the water. That will be spoken of later. Let us visit the N. W. Erickson farm and listen to the story of its superintendent.

"You say you want to know what tile underdrainage did for the marsh lands of Indiana? Well, I can't say too much in praise of tile. It has given us everything in this section; it has given us healthier conditions; it has lifted up our lands, so to speak; has given us something to grow crops on; and, after the giving, has made that soil open and porous, and has made possible our use of its rich fertility, enriching the soil in its work.

"Six years ago, Mr. Erickson cleared a section of the land here and raised onions in a small way. Of course, as soon as he had grubbed it he put in a system of tile underdrainage to remove the excess water; that was absolutely necessary. The first year's crop of onions was so satisfactory that he enlarged his farm and more thoroughly tiled the land. Each succeeding year more land was cleared, open ditches and tile drains were put in, so that today this farm consists of eighty acres of as rich soil as one can find in any part of the state."

Average of 500 Bushels to Acre.

As he walked over the fields of both set and seed onions, he pointed out the outlets and the territory of the main drains. Fourteen, twelve and ten-inch clay tiles are used for the main drains, while five-inch tiles, the smallest size used, make up the laterals. He showed a forty-acre field planted in corn and a four-acre tract of potatoes and then continued his narrative.

Barn and Storage House on Erickson Farm.

"This soil raises eighty bushels of corn to the acre, while the average yield in onions is 500 bushels," he said. "Two years ago we made the record yield of 700 bushels to the acre, and got 40 to 70 cents a bushel in the patch. We'll do that again. Our last season was a little off.

"Maybe you'd be interested in knowing how this farm was started. Mr. Erickson knew two young men who were working in the glass factory at Walkerton. They had had experience growing onions, knew the great possibilities in that section if the soil was properly drained, and urged Mr. Erickson to go in with them on a profit-sharing basis.

"These two boys were hustlers, knew their business and made good from the start. The business has grown so large that we have had to hire at times nine men to help us out. We plant as early in the spring as possible, just as soon as the frost is out of the ground. There are nine acres in sets and twenty-one acres in seeds. The seed onions are put in after the sets. We find along about the 10th to the 17th of April is the best time to plant. The set onions are harvested about the middle of July, while the seed onions the last of August. We grow the yellow and red globe onions. The first year we crated and marketed in Walkerton, but the business grew so large we had to store them, hence the building of that large barn over there and the storehouse adjoining it.

Good Prices Realized.

"The onions are taken from the field and dropped into bins, from which they are taken and crated when convenient. The crated onions are put in a storage building holding 13,000 crates. Just before the heaviest selling time for us the storage is entirely filled.

A Field of Onions Producing 700 Bushels to the Acre.

A Field of Seed Onions. Note Open Ditch Ready for Tile.

"When you consider the fact that we receive from 40 cents to 70 cents a bushel in the patch and raise more than 500 bushels to the acre each season, you can figure how profitable onion growing is in this section. Remember, this is in a place that for hundreds of years was considered an eye sore, a health destroyer, a swampy, marshy, good for hunting only—a place where mosquitoes thrived and the muskrat lived in peace and satisfaction. Tile underdrainage changed all this. It is the real backbone of our farm, so I cannot say too much for it. It removed the excess water from the soil and made the land tillable. It opened up the soil and allowed the air to circulate and the nitrogen (that much-needed element) to work down to the plant roots. Of course, this land was rich in fertility from the decayed vegetation of centuries; it didn't need tile drainage in that particular, but it did absolutely need tile underdrainage to make its fertility usable. The tiles make the soil warmer in winter and allow us to plant earlier because the frost goes out quicker than in land not tile drained.

Helps Resist Drought.

"We have plenty of water yet in this section, but in case there is a drought, tile will make our land drought-resisting, simply because it takes off only the surface water and retains the water needed, which passes back to the surface by capillary action.

"There never was anything manufactured of more benefit to the onion growers of this section than drain tile.

"We couldn't use the modern conveniences here today if it were not for tile underdrainage, for without it we would be living in the marshes with the tormenting insects, the fever germs, the croaking frogs and the song of the red-winged blackbird."

Tile underdrainage has indeed worked wonders in that section. But it is not there only that tile drainage has a great value. It is profitable to put in drainage systems in high, rolling land as well as in low, wet land. No matter whether the soil is dry or wet, tile underdrainage has its important function. The dry land may be too compact so the fertilizing elements are washed away into the gulleys with the passing rains. The underdrainage opens up the soil and permits the elements needed to percolate down deep to the plant roots and retains the water needed by the plant. Whether you are growing onions in Marshall county, corn in Franklin county, or wheat and alfalfa in Fayette county, in fact in any part of the state, there are very few soils that tile underdrainage will not greatly benefit.

FURNACE FUMES AND DUST CONVERTED INTO POTASH.

While Dr. F. G. Cottrell, who later became chief metallurgist of the U. S. Bureau of Mines, was a professor at the University of California, he took considerable interest in the subject of smelter fumes and dust and worked out a process for precipitating dust and converting some of the fumes. Recently it is said this idea has been applied to cement mill dust with the surprising result that it has reduced the dust fumes trouble and at the same time has resulted in the recovery of potash, an element much sought after in this country now for fertilizer.

It is said that last year one California cement company, which was compelled to install some dust preventative system because of damage done to orange groves in the surrounding territory, made an application of Dr. Cottrell's idea, which resulted, last year, in their selling $100,000 worth of the potash by-product, which returned a splendid profit on the investment necessary.

It is thought that as a result of this, other cement mills will be encouraged to use something of this kind, and in a broader way, the success there will likely arouse interest in the idea of reducing or condensing for the by-product fumes, gases and dust from furnaces of all kinds, even including brick kilns. That there are by-product possibilities in all escaping gases and dust is well enough known; it is simply a question of what by-products may be secured from any given kind of furnace or kiln and then of finding a process for securing it that will mean a profitable side issue. This is a subject that has been touched upon by The Clay-Worker under the head of "Work For Our Chemists." There is room for splendid research work, both by chemists and engineers, in recovering and utilizing waste products that go up in gases and fumes of our industries.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THERE ARE TWO important factors this month which render the general business situation on the Pacific Coast rather dubious: The Mexican trouble and the Longshoremen's strike. The strike is having a serious effect on all building operations, except in such communities as depend wholly upon railroad shipments, and even in these places there will soon follow industrial distress if the water shipping is much longer held up. In San Francisco, where the condition is most acute, there are reported several thousand carpenters out of work, not because of a strike among them, but on account of not being able to get lumber from the yards. All the local yards, except one—which signed up with the strikers—are tied up. Furthermore, it is the desire of the lumber interests to tie up the building trades, thus forcing a speedy and definite conclusion of the trouble. In Oakland and the Bay regions, the building operations are much hampered, but as yet not disastrously. Concrete work of all kinds is being delayed on account of difficulty in getting timber for molds, and, naturally, a great deal of brick and tile work is also affected.

Sanitary improvement work throughout California and the Northwest is going ahead all along the line and plans for extensive new work are being announced in many of the coast cities. Vitrified sewer pipe is still used for the great bulk of the work and the sewer pipe manufacturers are pretty busy. It is to be noted that municipalities nowadays on the coast are investigating with extreme thoroughness before launching sanitary engineering work. Faulty construction and inadequate installation in recent years has shown that work hastily contracted for is most expensive. Several large cities of the interior have had to reconstruct their sewer systems in consequence of poor judgment in the initial planning.

Terra cotta shows a healthy condition, indeed, though the business is not rushing. Efficient publicity work has greatly extended the market for terra cotta products, and coupled with this, the factories have been diligent in producing new terra cotta materials to meet all sorts of new conditions. As a purely structural material, terra cotta, hollow tile and interlocking tile are meeting with fine success. For buildings of the smaller type the use of these materials has been especially popular of late. Ornamental terra cotta is used more generally than ever. Many new moving picture theaters in this vicinity have most attractive facades ornamented with polychrome terra cotta.

The brick market is a little unsteady in sympathy with the general building situation, but there is small likelihood of any effort being made to force things. Such a course would only prove futile at this time. No factories have been reported closed down and several new concerns are beginning operations. The building season is long on the Pacific Coast and any temporary lull may be made up for by rush work later and the employment of larger working crews in construction operations.

The Pratt Building Material Co. is supplying Hercules interlocking tile for a number of important jobs, among which may be mentioned the John Bollman building, Fourth and Bluxon streets; a business block at Eighth and Mission streets, and a large apartment house at Jones and Hyde streets, San Francisco.

"Thru-and-Thru" terra cotta, the new product made by the Steiger Terra Cotta & Pottery Co., is being shown in several new styles in their window display in the Mills building on Bush street. This high-class colored product has solicited many inquiries from architects and builders and no doubt its special merits will lead to its use in the near future on important structures. The company is giving special attention at this time to demonstrating the properties of the material.

The Stockton Fire Brick Co. is having a very nice business and provision is being made for enlarging the capacity of the plant at Stockton. The San Francisco offices of the company are now located in the Rialto building, Mission and New Montgomery streets.

The terra cotta manufacturing department of Gladding, McBean & Co., at Lincoln, Cal., has been compelled by rush work to add considerably to its force of mechanics in the past month. The company is enjoying a better terra cotta business than for a long time. The face brick business and vitrified sewer pipe business are also in pretty active shape.

N. Clark & Sons have been given the contract for the terra cotta on the new high school at Los Angeles and other jobs of less importance. Mr. Gwynn, manager of the company, says the terra cotta situation is looking up favorably in California. The polychrome product made by this company is being used as a decorative material on many local jobs, and it is specified for the new court house of Lassen county. The company is supplying great quantities of vitrified sewer pipe for sanitary engineering work at Stockton and other smaller places.

The Garden City Pottery Co. has just shipped three cars of flower pots to Honolulu. Mr. Raymond, the manager, states that the export business of his company is becoming an important factor, and that in general the flower pot business is greater now than ever before.

The city of Modesto, Cal., is soon to be the center of important new clay products manufacturing. The Union Brick & Tile Co., with capital stock of $50,000, has filed articles of incorporation and will begin work immediately on a new brick and tile factory on the 40-acre ranch of E. K. Finney, two miles north of Modesto, on the Tidewater Southern, with expectations of turning out its first kiln of brick within sixty days. The directors of the corporation are D. W. Morris, N. E. Leek, W. A. Downer, J. S. West and W. M. Anderson. The promoter of the enterprise is W. M. Anderson, who is a brickmaker of thirty years experience. Under his supervision, the clays have been tested and initial experiments made which prove the splendid feasibility of the raw materials for brick and tile manufacture. The first building of the factory will be a frame structure 100x100 feet in dimension. Brick of all varieties, building tile and blocks and irrigation tile will constitute the output of the plant.

The sewer contract for the Sunnyside Terrace tract at Martinez, Cal., has been awarded to Ricks & Hayden.

The contract for the construction and improvements of sewer work at Fresno, Cal., has been let to O. Frederickson, of Fresno.

SUNSET.

San Francisco, July 5, 1916.

WITH THE NEW JERSEY CLAYWORKERS.

The annual meeting of the New Jersey Clayworkers' Association was held at Trenton, N. J., Friday, June 30, with nearly 100 in attendance. Secretary Parmelee had arranged an exceptionally good program, dealing mostly with matters of interest to potters. Professor A. V. Bleininger, of the Bureau of Standards, Pittsburg, Pa., presented an instructive paper on "The Properties of Some European Bond Clays" at the afternoon session, and at the evening session, Professor Edward Orton, of Columbus, Ohio, entertained the members and visitors with an address, entitled "The Future of Ceramic Education in America," which, by courtesy of the association, we are able to present to our readers in full on the preceding pages of this paper. All of the papers will be published in leaflet form by the association, later.

An Ohio farmer, suing for divorce, claims that his wife has been taking joy rides with another man on a fertilizer spreader.

BIG CLAYWORKING PLANT ADOPTS INSURANCE SCHEME FOR THE PROTECTION OF FAMILIES OF EMPLOYES.

According to the local press of Ottawa, Ill., the Chicago Retort and Fire Brick Company, which is operating an immense refractories plant at that point, put into operation June 29, a plan for the insurance of employes for the benefit of their families in case of demise. Mr. Charles S. Reed, the president of the company, is a real captain of industry with progressive ideas. As outlined by him, the plan provides for an insurance policy on each employe who has been in the company's employ for thirty days or more. The insurance is written by the Travelers Company of Hartford. For those who have been employed for thirty days to six months the amount of insurance will be $250. Those who have been employed six months to one year will be insured for $350. Those employed from one year to two years, will be given $500 insurance, and those employed for two years or more will be insured for $750, that being the maximum amount of insurance. The insurance will be rewritten from year to year at the expense of the company. It is hoped that this measure of protection will be appreciated by the workmen and will result to their advantage. The policies will in no way affect the rights of the employes under the compensation law.

EXPERIMENTS AND TESTS WITH LUBRICATING OIL.

Practically all machinery users understand in a general way that proper lubrication is essential and that some sense and judgment must be used in the purchase and application of oil for machinery and machine parts. Often, however, definite information as to the exact mission of oil, how long oil lasts and where it goes to is lacking. Now and then some one makes some interesting experiments and tests which give us specific light on this subject and are a great help to a better understanding of the subject of oil and its use in lubrication.

Some experiments of this kind were recently conducted to determine whether or not oil actually wears out, how long it may last and be used over and over and just exactly what deterioration it does suffer from use. The result of these tests is shown by a report made, and seem to prove conclusively that oil will last a mighty long time if properly handled and filtered. In other words, it can be used over and over again indefinitely without losing any perceptible amount of its lubricating qualities.

One specific instance of tests to determine this point was that made at the Hotel McAlpin, of New York city, which is equipped with a filtering system supplying what is known as flooded lubrication to engines and air presses and pumps, covering all told a total of 134 points of lubrication in the system.

The plant is operated 24 hours a day and every day of the year with an average temperature of 100 F. in the engine room. A good grade of mineral oil is used. The average amount handled by the lubricating system during this test was 150 gallons an hour or 360 gallons a day. In continuing the process of lubricating with this system it was found to be only necessary to supply about three barrels of additional oil per month. Even these it is contended are not properly chargeable to shrinkage in the lubricating system for large quantities of oil are drawn off from the filter and used in cans for hand oiling.

The purpose of the experiments was to determine what changes, if any, were undergone by the oil in the process of being used for lubrication. Samples of the fresh oil were taken from the barrels and sent to the testing department of Cornell University and also samples from the clean oil compartment from the filter—of oil that had been used.

The result of these tests are set forth in somewhat elaborate detail but the sum and substance of it is that for all practical purposes properly filtered oil is as good as new oil under all operating conditions. In other words, the important point established by these tests is that oil does not wear out nor depreciate perceptibly from use, that is the oil itself does not. However, to be kept in continuous use it must be filtered and put in proper condition to use again. By a proper process of filtration oil may be used over and over indefinitely and continue to give good satisfaction so that instead of buying new oil one can use the same oil adding simply enough new to make up for loss through incidental waste of various kinds.

TRACTOR DEMONSTRATIONS INDIANAPOLIS WEEK, AUGUST 28.

The "mystery tractor," which is to be shown for the first and only time at the gigantic tractor demonstrations at Indianapolis the week of August 28, has aroused an unusual interest in agricultural circles as well as among business interests. Definite assurance has been given by the management of the exposition that a tractor which does more work at less expense, and costing much less than any of the present machines, will be shown exclusively at the exposition in Indianapolis. The promoter of the new tractor is known only to the management of the exposition, and details as to construction and operation are withheld. It is known, however, that the manufacturer is one of the leading automobile manufacturers of the world and correspondence concerning the production of the tractor is coming from Detroit, Mich., and announcement is made that it will sell at an exceptionally low price. It is of interest, especially to the small farmers of the Central West. It is believed that this tractor will revolutionize agricultural work throughout the United States, and farmers consider it to their financial advantage to learn the operation and work of the new models. Promoters of the old tractors are worried as to what effect the new machine will have on their products.

Advices reaching the Indianapolis Tractor Club, under the auspices of which the demonstrations will be given, are to the effect that approximately 100,000 farmers from throughout Indiana and surrounding states will attend. Demonstrations showing the actual operation will be given, both morning and afternoon, on a 600-acre tract six miles west of the city, on the national road. Firms representing $350,000,000 will exhibit their products. The exhibitions will be staged the week preceding the Indiana State Fair, and it is understood that many persons are planning to make a trip to Indianapolis to visit both the fair and the tractor demonstration as part of the centennial celebration of Indiana.

ALARS! ALARS!

Time was when ladies' skirts were less revealing,
  And legs were not paraded everywhere,
To set the eyes if not the senses reeling,
  Whenever one went out to take the air;
Time was when ankles wrought sweet perturbation,
  When one some interest in them might avow:
Today there's nothing left imagination.
  Ah, me! I'm like the London Busman now—

but maybe you don't remember the one about the skipper of the London omnibus? A stout lady passenger was climbing down from the upper deck, when, as luck would have it, her skirts were in some manner caught so that, unable to complete her descent, she lingered helplessly midway. Whereat the busman waiting below, bellowed: "Now then, lady, come on down, come on down- Legs ain't no treat to nobody in my business."—Book of Smiles.

The man who bought what new machinery he needs early last winter can now pat himself on the back.

OBITUARY.

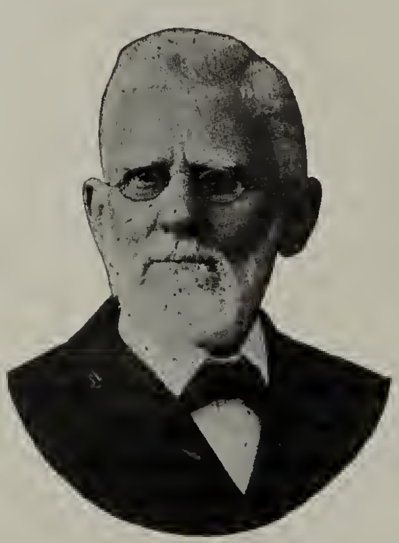
DEATH OF EDWIN BROCKWAY.

Long Conspicuous in the Brick Business on the Hudson River, Edwin Brockway Dies of Heart Failure on July 4.

EDWIN BROCKWAY, a pioneer Hudson river brickmaker, a charter member of the N. B. M. A., answered the final summons at his home in Brockway, N. Y., July 4, 1916. Mr. Brockway died as he had lived, calmly and peacefully, as if merely going to sleep. He had had symptoms of heart trouble for a year or more, but no serious effects were anticipated. He was sitting in his easy chair at home when the grim messenger claimed him, with scarcely any warning. His son, Ed J. Brockway, writing to The Clay-Worker of the sad event, says: "He has left us an example worthy to follow, having lived a life of no regrets."

Mr. Brockway was buried with Masonic honors by the Stony Point Lodge, No. 313, F. & A. M., of which he had been a faithful member for fifty years. He was born in Glasco, Ulster county, New York, in 1838. When he was a boy his father moved to Haverstraw and engaged in brickmaking, so the deceased grew up in the business and has been a conspicuous figure there in that industry ever since.

He was a charter member of the N. B. M. A. and seldom missed an annual convention. He was a modest man and rarely spoke in public, but nevertheless he took an active interest in the association and was known and respected by the entire membership. His wife usually accompanied him at the annual gatherings. She and the children, three sons and one daughter, will have the sincere sympathy of the members and their families. The sons have been associated with him in the brick business for a number of years, and the Brockway Brick Company will be conducted by E. Joseph Brockway, president and treasurer, and A. Ernest Brockway, as secretary.



Edwin Brockway, Brockway, N. Y.

The sentiments exemplified in the daily life of Mr. Brockway are shown in the following, found written in his dairy of 1916:

"Reputation is often what the world makes and gives.

"Character is what man makes and holds.

"Character is the full-grown corn on the ear, brought forth by attentive cultivation.

"Reputation is the tassel, which bends and sways with every passing breeze of public opinion.

"We all love to pick the fairest fruit and to gather the sweetest flowers, but put this down as a truth worthy to be engraved upon a pillar of gold, that more enjoyable fruit grows by the wayside of the path of duty than in all the wilderness of willful inclination."

F. W. Walker, of the Beaver Falls Art Pottery Works, of Beaver Falls, Pa., who is making a tour of the Pacific coast in the capacity of commissioner for the United States Tile Association, was the guest of honor recently at a luncheon given by the Commercial Club of Seattle, Wash., during which he gave an address on "The Latest Development in the Tile Business," which was profusely illustrated with lantern slides. Mr. Walker is well known to the trade, having been president of the American Ceramic Society, and is still active in the work of that organization.

WITH THE FOREMAN IN CHARGE.

During the busy summer season is when interest, capital, profit and business generally centers around the foreman in charge of the different departments of the work of converting raw clay in to the finished product and then shipping it out. It is the man on the job pushing things day in and day out that must be looked to to keep the wheels of business moving as they should move, the output up to requirements and the expense down to the point where there is a profit from the returns.

And, by the way, there is nothing like being on the job. Being on the job is really the best thing the foreman does. It matters but little what other qualifications he may have, unless the foreman is on the job regularly from morning till night the work will be disappointing unless he has a crew of men so good and so well trained that they will work just as well without the foreman—and when he has that there is really no need for the foreman. Being on the job means being right there, too—not in the office or in some nearby cool resting place—but right on the job where the work is going on all the time. It not only has a stimulating effect, but it keeps the foreman in a position to give instant attention and direction whenever his judgment or advice is needed. That is what he is for, to be a leader, be the foremost man in charge of the work, and it is why the very name was created.

Another thing, the foreman should be on the job early and stay there late. There would never have been any serious need for time clocks, neither would there have been much of this morning tardiness if the foreman and superintendent in charge always made it a point to be on hand at starting time in the morning. It is the foreman being a little late in getting to work that leads others into tardiness and eventually has a disorganizing influence. On the other hand, when a crew of men once thoroughly understand the foreman will be there every morning at starting time they will practically all do some hustling to get there on time, and there will be very little tardiness. There may be occasionally a man here and there who has this late coming habit so deeply rooted in his system that he can't shake it off. When a case of this kind is found one should try some heroic means for curing, and if incurable get rid of the man, for it is very disorganizing.

There is in mind right now a specific case illustrating the point of the man in charge being on the job early acting as a stimulant to others. There is quite a prominent institution of which the vice-president is the active man in charge and is an old fashioned type of early riser. At his place they go to work about 15 minutes to 7 in the morning, and it is very seldom that any one of the employes ever beats the vice-president on to the job in the morning. From time to time one will try the experiment of coming a little early so as to be ahead of him, but almost invariably the first man there finds the vice-president down on the job ready to give him greeting and with his coat off ready for work. You can just bet, too, that there is very little tardiness in this institution. That is the whole thing in a nutshell. If the man in authority is on the job early practically all the others will be there and it matters but little whether there is a time clock or not.

Placing the Men.

One good way to use the system idea in foremanship is in the selection and placing of men. This idea applies just as well with men digging dirt in the old-fashioned way, with the tile spades or the plow and scraper, as it does with the more modern methods of steam shovels and dump carts. Nearly every good man is so constructed that he can do certain kinds of work better than others, and that he will fit more comfortably into certain kinds of work than others, and produce a greater degree of efficiency while enjoying the work more himself. There are some people who are not worth their feed in the use of pick or shovel, while there are others who are regular moles for burrowing in the ground with a tile spade. When it comes to the use of more modern appliances the good man is generally worth much more money than with the old crude tools. It was the invention of automatic ore loading devices at lake shipping points which raised the pay of stevedores to sixty cents an hour, according to a graphic picturing recently shown in the Saturday Evening Post. It is the same way with variations everywhere. The invention and introduction of labor-saving devices invariably raises the wages of men in charge of the work. It takes men who will use brains as well as hands to accomplish most of these things, and a good man can accomplish so much more in comparison to the incompetent one that he is the cheaper man at two or three times the cost. The foreman's job in a thing of this kind is to study his men analytically, experiment with them now and then and learn the art of selecting and fitting men to the place where they will give the greatest service and be the best satisfied.

DRESDEN'S FAMOUS CLAY.

Its Value Was Brought to Light by a Freak of Fashion.

Did you know that the discovery of the material which makes translucent chinaware possible was due to the vanity of man—not mankind, which includes woman, but to masculine man? It came about in a remarkably devious manner, beginning and ending a little way from the spot where Dresden china is still manufactured. The man who identified the long-sought substance was an eminent chemist, John Frederick Boettcher, but the scientist would never have had the substance to analyze had it not been for the circumstances of a muddy road, the vanity of society beaus and a shrewd business man who thought he had found a profitable means of catering to that vanity.

The man was riding from his iron foundry by a short cut when his horse's hoofs stuck in the mud. That mud next day disintegrated into a fine white powder when it was thoroughly dry. The founder conceived the idea of turning the white clay into powder for the fashionable bob wigs of court dandies. Even the king, Augustus of Saxony, fell for it, but it was not satisfactory, so Augustus ordered the chemist, Boettcher, to analyze it to find if it was injurious. To his amazement the man of science found that this Dresden clay was the same substance that had been used for 1,800 years in China in the making of the ware that had never been imitated anywhere else in the world.—St. Louis Globe-Democrat.

HARRY F. FLOOD, JR., TAKES A LIFE PARTNER.

The Chicago papers have recently been making a first-page headliner of Harry J. Flood, Jr., son of the well-known manager of the Chisholm, Boyd & White Company, of that city. Flood, junior, surprised his friends and associates by joining the benedict class, marrying Miss Gretchen Adams, a South Side belle. Thus he makes his first appearance as a hero in the game of romance. He has on many former occasions been the hero of the football teams of the Chicago University. Mr. Flood's hosts of friends will join heartily in wishing the young couple a happy voyage.

THE BRICK SLOGAN.

How the Build With Brick Slogan Was Made Famous.

ONE of the interesting signs of the country that is met up with here and there nearly everywhere that practically everybody has taken notice of, contains in prominent type the three words, Build With Brick.

This is the slogan of the brick manufacturers, an injunction set forth in brief form to the people of the world, that has become famous throughout this country and even in other parts of the world, and incidentally it has developed into the greatest single advertising stroke of the brick industry. The conspicuous display of this sign and the display of these words on calendars, letter heads, banners and posters of all kinds is the result of a campaign waged by The Clay-Worker, the official organ of the National Brick Manufacturers' Association, beginning in May, 1914. About a year previous to that time the idea was conceived by the editorial staff of that publication that if the injunction "Build With Brick" could be driven home to the people of the world, could be posted up in some form so that it would be staring them in the face all the time, the result would be to impress brick as a building material upon the public mind so that every man contemplating the building of a home or other structure would be reminded of brick and would, before building, proceed to make inquiry into the why and wherefore of it and the possibilities of its use in his work.

An appeal was made, through repeated issues of the publication, to the brick men of the country to each secure and put up a quantity of signs along the roadway, on the buildings and everywhere that they might attract attention, containing preferably nothing but the words "Build With Brick," or, if other matters were to be included, these three words would be made to stand out conspicuously. In other words, they would constitute the slogan of the brick trade.

This started it and the idea took so that pretty soon brick manufacturers all over the country were buying posters of uniform type and putting them up in every direction. It was a simple, inexpensive thing to do, and the wonder is that brick manufacturers had not thought of it heretofore.

As the idea grew in public favor, it developed enthusiasm until many striking features were developed.

In some of the larger cities the brick men got together and made a big occasion of the distribution of these signs, going in parties with automobiles and spending days out on the roadways tacking up the signs.

One enthusiastic brick manufacturing concern in Cleveland went to work and erected an ornamental roadside brick panel, containing the slogan, to cost approximately $10,000. The brick slogan became the feature of brick displays at fairs and expositions and pretty soon was creating world-wide attention. Inquiries came in from Holland, Sweden, countries that made brick before this country of ours was settled up and they became enthused over the idea.

The very simplicity of the thing has contributed greatly to help make it famous. There was no confusing or obscuring arguments or details to mix in with it. There was the simple injunction to "Build With Brick." The question of why was left to the imagination of the public or for them to ask the brick manufacturer about. There is plenty of argument that can be used and the brick manufacturers are well supplied with it. The important thing, however, and the big purpose behind the movement which made this sign famous and conspicuous all over the world was that it carried a reminder of brick. It was not an introduction of something new, but a reminder of a great building material that has been known to mankind as far back as history goes.

The result of this idea, and its fostering was not only to make this brick slogan famous and so popularize it that it is used in almsot every form imaginable and may stare you in the face from a box of cigarettes as well as from a sign on the road, in your news-paper or on a wall calendar. It has also proven to be the most effective and least expensive advertising ever undertaken by the brick industry. Every man puts the sign along the way in his own community to suit his own ideas, and since brick manufacturers are scattered all over the country in every state in the Union it is easy to understand how that everywhere all around us we are now confronted with the injunction to "Build with Brick."

You have perhaps observed the sign yourself many times. When you see it again let it remind you of the effectiveness of advertising because it is one of the greatest examples of effective advertising at small cost that can be found.

LATIN AMERICA AS AN EXPORT FOR UNITED STATES BRICK AND CLAY BUILDING MATERIALS.

By Alfred Thomas Marks.

IN THE YEAR ending December 31, 1914, the Uuited States exported to Latin America (including Mexico and Cuba) brick and clay building material of all descriptions to the value of $389,000.

Latin America's importations in these lines from all countries in 1914, totaled somewhat over $4,000,000.

These figures will give a fair idea of the extent of the market now open to our brick exporters.

Correctly speaking, the war conditions in European countries, as affecting their foreign trade, were not severely felt in Latin America until the end of 1914, for the reason that the brick and many other stocks in nearly all the South American importing countries were large and met the demand—lessened somewhat, it is true, by the monetary stringency—fairly well, with the substantial help of our United States exporters.

But now Latin America is face to face with a situation that can only result in opening wide the door to American exporters of brick and all building materials. Germany and Belgium, formerly among South America's leading sources of supply, are entirely shut out from the Latin American markets; England and France are sending but little brick to South America. And, to use the expression of a well-informed Latin American delegate to the recent Pan-American financial conference, "If the United States doesn't do nine-tenths of the building material business of South America this year, it will be for the reason that it doesn't want the business."

Going About It Right.

Notwithstanding the pressing invitation to "come down and get the business," there are certain rules and usages which must be followed, and the strict observance of which "cinched" the business in past years for the European countries.

Careful consideration and sound judgment must be used in the selection of the distributor, as almost the entire proposition depends upon him. The day of the specialist has not yet arrived in South America, and a firm looking, for instance, for a handler of brick and clay products would have a hard job finding one handling this line alone. In Montevideo, for example, is a large, well-established and prosperous concern, where bathtubs, fireworks, coffins, auto tires, fruit-spraying machines, and probably fifty other articles are for sale. Most of these firms have been in business for many years. They know the likes and dislikes of the retailers as well as the buying public, and rarely accept an agency which will not turn out a success. Some of the largest of these firms have so many lines that it is not always wise to force them to accept new ones. But new houses are constantly springing up, mostly under the management of former employes of the old houses, and these are quite often preferable, as they devote more time and energy to their fewer clients.

Real Salesmanship Necessary.

American manufacturers already in the business of exporting to any part of the world as a rule do not need information as to how to reach the South American trade. There is no fundamental difference between reaching Latin American trade and reaching trade in Europe, Asia or Africa, except this—that the Latin American trade always demands personal contact. Letters, circulars, catalogues, etc., addressed to prospective buyers or commission houses, in ninety-nine out of a hundred cases accomplish nothing in Latin America. To reach the Latin American trade you must send a salesman; that is the only way. Of course, once the line has been placed on sale, either through a distributor or exclusive branch agency, the business takes care of itself.

The question then arises: What kind of a salesman? Must he speak the language of the countries (Spanish in all except Brazil, where Portuguese is the national language)? As to the latter question, generally speaking, yes. Consider what a merry time a foreigner would have trying to sell goods in this country without the ability to speak English.

The first requisite, however, in a Latin American salesman—more important, even, than the ability to speak the language—is salesmanship. "Send salesmen, not peddlers," is the mesage from the southern republics. There is no material difference in salesmanship in any part of the world. A man who can sell goods in Texas can ordinarily sell them in London or Buenos Aires.

One point always to be remembered in dealing with South Americans is that they demand more personal consideration than do the buyers in any other part of the world. They do not like the brusque, abrupt style of salesmanship; in fact, they resent it. As buyers they cannot be classed with those in this country you can sell "between trains."

The Matter of Credit.

European exporters have been accustomed to giving longer credits than we usually care to give, but this matter is not so serious as many have made it appear. It is a mistake to suppose that six to twelve months' credit is necessary when dealing with the Latin Americans. There are numerous firms now which, after the first shipment, and after it is proven to them that there is a fairly ready sale, will discount their bills on their arrival at their shipping offices, while others will readily agree to meet draft attached to bill of lading. These drafts are negotiable papers, and can be discounted at any of the large banks; and as the customer pays the regular interest of 6 per cent. on the money from the date of shipment to the date of paying the draft, the exporter does not lose a cent of interest by the transaction. It is well, too, to bear in mind that there are very few instances where an American merchant will pay for his goods the day they leave the factory, and before they are in his possession; and there is no reason why, for instance, a merchant in Buenos Aires should pay for his goods on delivery in New York when it will be from two to three months before he actually receives them. Taken as a whole, the financial responsibility and business integrity of the Latin American merchant is at least as high as that of the average American busines man; in fact, in some instances, higher.

Use the Language of the Country.

The matter of correspondence means much to the Latin American business man. He is much more "touchy" on that score than is the American. He prefers to be addressed in his own language, and objects just as strongly to receiving a letter in English as the American merchant would to receiving one in Spanish or Portuguese. As a matter of fact, he considers it an act of discourtesy, and will quite often not answer at all. This refers as well to business literature of all kinds, which nearly always gets a quick shunt into the waste basket unless couched in Spanish or Portuguese, according to destination.

Latin American Postal Regulations.

Postal regulations in South America are very strict, not to say somewhat remarkable. A person receiving mail with insufficient postage attached has to pay double the amount due, which frequently amounts to 20 or 30 cents in their money. American firms, especially those not versed in export business, leave the question of postage on foreign letters usually to the office boy, with the result that quite often a South American merchant receives a letter for which he has to pay quite a heavy fine, and finds that it is in a language that he does not understand and probably crammed full of literature which does not interest him.

About Quoting Prices.

European merchants, in quoting prices on goods, will either quote f. o. b. Hamburg, f. o. b. London, f. o. b. Antwerp, or some other large European port, or f. o. b. steamer at the Latin American merchant's port of entry, as they fully realize that it is impossible for a man in the interior of South America to find out the cost of freight on an article from the factory to the port of shipment, especially as they do not know the weight and dimensions. Quoting some small inland town in Indiana or Michigan means almost invariably the loss of a sale. South American merchants will order only where they know the exact cost delivered at their own wharf.

Trade Follows the Loans.

Another point worth mentioning, and which will have a strong bearing on present and future commercial relations of the United States and Latin America, is the fact that South America, for years to come, will be unable to borrow money in Europe. As many of her requirements are imperative, she will be obliged to come to the United States for financial assistance—in fact, has already done so—and it is now recognized as a modern law of commerce that trade follows the loans.

Brief Survey of the Market.

In order better to appreciate the opportunity presented to the brick exporters of the United States, a brief glance at the status of the trade in several of the leading Latin American countries will be helpful.

In 1914 Argentina, our best customer among the South American countries, imported brick and clay building material of all kinds to the value of $1,300,000, of which amount $98,000 worth came from the United States, $471,000 from England, and the balance divided among Germany, France and Belgium. Included in Argentina's importations were refractory brick, vitrified tiles, common tiles, clay tubing, mosaics, roofing tiles. Of the common tile, roofing tile and clay tubing the United States exported none to Argentina, by far the greater proportion of these exports having been from England, with Germany and Belgium about evenly matched for second place.

There are in Buenos Aires, the capital and principal city of Argentina, 124,600 houses built of brick with stone trimmings, and 11,000 buildings of brick alone. In the outskirts are thousands of colonists' houses, mostly temporary structures of wood, mud and straw. These will be replaced, according to a new city regulation, before January 1, 1917, with brick buildings.

Brazil, the largest of the South American republics, is a most promising market for American building materials of all kinds, notwithstanding the fact that last year it made in its own brickyards and clay works products to the value of nearly $2,000,000. In 1914 importations in these lines amounted to $1,200,000, of which amount the United States sold $79,800. Brazil is the fastest growing of the Latin American republics, and promises to provide a market for United States brick and tile which will be well worth cultivating. American products are well received there, and now that European sources of supply are practically cut off, our exporters should give close attention to this field.

In entering the Brazilian market, the use of printed matter, catalogues, etc., alone is a mere waste of time, as the only practicable way is to work through local agents. These agents should, if possible, be selected by a traveling representative of the American firm, who can at the same time look over the field and size up the posibilities. A resident agency here is so much more necessary than in other South American countries, for the reason that the personal element in trade is so much more a factor than in the United States that a firm already well known has a great advantage over the salesman new to the country and the people.

Chile, on the west coast, in 1914, imported brick and clay materials to the total value of $196,000, about half of which was for fire brick alone, the United States furnishing $26,000 worth and England $60,000 worth. It is expected that Chile will prove a rich brick market, now that the Panama canal is in operation, and from the further fact that the country is on the eve of a season of unusual prosperity.

Uruguay is one of the most promising of all South American markets for United States brick exporters. Not only is the country progressive in spirit, with an energetic and industrious population, but American manufacturers are well liked and American trade representatives meet with a cordial reception. In 1914 Uruguay imported brick, tile and tubing to the value of $76,500, the United States furnishing about $39,000 worth.

Peru bought foreign-made brick last year to the total of $68,000, of which somewhat over $35,000 worth came from the United Kingdom and $26,000 from the United States. Peru will not keep pace with its more progressive and enterprising sister republics, for the reason that about one-half of the population is made up of Indians, who are backward in adopting the white man's style of habitation, and who are satisfied with present rather primitive conditions. However, with immense potential wealth, Peru will take a high place among the Latin American countries.

The details given as relating to the larger and more important of the Latin American republics apply, with but slight variation, to all the countries of Central and South America. In the matter of brick and clay building materials, our products are generally well liked, and the only reason we have not for years past controlled the market is that the European countries—notably the United Kingdom and Germany—have used far better salesmanship, have gone after the trade in a much more energetic and methodical way, and have taken pains to understand the people and their requirements—all of which our United States manufacturers have, in great measure, disregarded.

THE BOOK OF SMILES.

The current issue of The Book of Smiles is certainly good reading for the heated term. One cannot read it without getting immediate relief from all temporary troubles, and the lessons which it teaches in regard to improved methods of drying brick and tile brings permanent relief to those who adopt the suggestions and install the equipment of the Standard Dry Kiln Company. Users of Standard outfits habitually wear the smile that won't come off, but these are broadened by the quips and jingles in "The Book of Smiles." There's nothing dry in it, not even the ads. Copy can be had for the asking. Address The Standard Dry Kiln Co., Indianapolis.

SOLDIER BOYS.

PATRIOTISM has ever been a marked characteristic of Americans, and just now it is made manifest in many ways, both in public and private life, throughout the Nation.

One of the first of the soldier boys to respond to the call for military duty at Indianapolis was Edward H. Bassett. His father, on being informed that his boy reported for duty as a member of the Indiana National Guard, was inspired to write the following verses as an antidote to the catchy popular song, "I did not raise my boy to be a soldier," and they will be read and the sentiment echoed by many whose hearts ache at the thought of their own boys being called to face the guns of the enemy, but who, like Mr. Edward W. Bassett, are willing to make the sacrifice if it is necessary to uphold and protect the Stars and Stripes:

Edward H. Bassett, Indianapolis, one of the first to respond to Uncle Sam's call.

WHY I REARED MY SON.

I reared my son to be a man
To take the manly part,
To do his duty day by day
With firm yet tender heart.
I reared my son to be a man,
God's noblest handiwork—
And God forbid that he should fail
Or any duties shirk.

To fight the world for selfish gain
Is worthy, this we grant,
But nations' aims for human kind
Are far more militant.
Not reared to be a bullet's mark—
Perish the coward's thought—
Yet man to be among God's men,
For this his life we wrought.

And nation first, for what have we
If "Glory" trails the dust?
That mother loves her first-born most
Who tenders first this trust.
Like Nathan Hale, our one regret,
One only life we have,
To place on nation's altar fire—
God grant that chance to give.

THE VALUE OF FACTS.

Misunderstanding is the cause of a good portion of the disputes between men all over the world. Next to this evil ranks the common sin of accepting as Bible truth some gossip picked up on the street, in the shop or in the home. One of the most violent strikes which has taken place in this country in recent years has been found to be due directly to the fact that employes accepted a will-o'-the-wisp report that their employers had realized 45 per cent. dividends on their stock holdings. The truth of the matter, which was shown to be available to any man in the plant who wanted to see a correctly audited and sworn statement of accounts, was that the corporation earned and distributed a 7 per cent. dividend for a single year, after failing to pay dividends of over 2½ per cent. for the two preceding years and passing dividends for three years prior thereto.

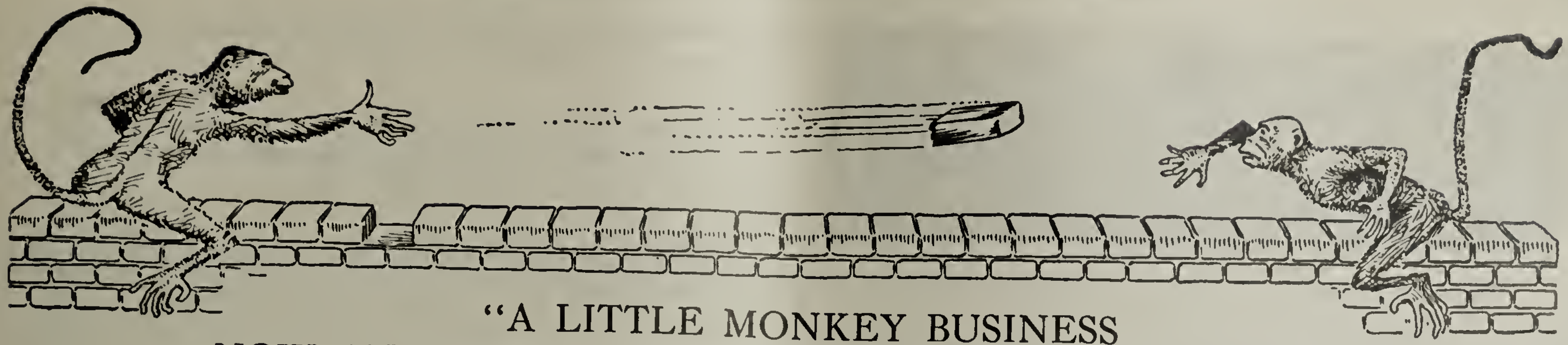
No effort was made by the employes who struck when their wage demands were not promptly decided and granted, to verify the accuracy or authenticity of the source of the 45 per cent. dividend report. The rumor, however, was later admitted to have been the principal motive actuating the demand for a 10 per cent. increase in wage rates. But considerable violence had been indulged in by the misled strikers and material damage to the plant and surrounding property inflicted before the dispute began to unfold itself in arbitration conferences.

Ten of the principal figures in the strike subsequently had private and extemporaneous conversations with the head of the concern, the employes of which had previously believed they had every right and reason to ask and expect an increase in wages as their share of the reported 45 per cent. melon for stockholders. After the plain, unvarnished facts about the results of the company's operations, both the previous year and years prior thereto, had been discovered, every one of these ten laboring men confessed that they had acted on the "common report on the street" and readily admitted that had they known the real facts, the strike would never have taken place.

Such are the sins of omission which exist in many branches of industrial production, with relation to the lack of co-operation and get-together spirit between employers and employes. The fault is generally on both sides, although in the case cited the employers were never given an opportunity to tell the facts as they were before the strike was on. In most instances, however, where such misunderstanding exists, the employer who does not see to it that his employes are as fully and truly in touch with results of their combined productive efforts, is open to the same form of criticism as the employes who go on strike with unauthenticated information as the basis for the bill of rights they are fighting.—American Industries.

After a shut-down of many months the brick plant at Youngsville, Pa., is again in operation. The company has been reorganized under the name of the Colonial Brick Company, with the following officers: C. E. Foster, president; E. C. Swanson, managing director, and C. P. Cloak, treasurer.

Two fires, which started simultaneously in widely separated parts of the Hydraulic Pressed Brick Company's yards, St. Louis, Mo., are believed by police and officials of the concern to have been of incendiary origin. Two sheds in which new brick was stored were destroyed. Straw was placed beneath lumber in the sheds. Watchmen discovered the straw, but saw no one about the plant. The yards are at King's highway and the Frisco tracks, and firemen had difficulty reaching the blaze. The damage was estimated at about $3,000.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

His Preference.

"What part of th' turkey will you have, Mr. Squizee?"

"The Harem, Madam."

* * *

Her Way.

"Mrs. Clinnick thinks a great deal of her husband."

"You've got the wrong preposition. Make it 'for' instead of 'of'."

* * *

Stranger Than Fiction.

"Oh, yes," Mrs. Smith told us, "my husband is an enthusiastic archaeologist. And I never knew it till yesterday. I found in his desk some queer-looking tickets with the inscription 'Sphinx 8 to 1.' And when I asked him what they were he explained to me that they were relics of a lost race. Isn't it interesting?"—Modern Society.

* * *

A Gift.

"Some un sick at yo' house, Mis' Carter?" inquired Lila. "Ah seed de doctah's kyar enroun' dar yestiddy."

"It was for my brother, Lila."

"Sho! What's he done got de matter of'm?"

"Nobody seems to know what the disease is. He can eat and sleep as well as ever, he stays out all day long on the veranda in the sun, and seems as well as any one, but he can't do any work at all."

"He cain't—yo' says he cain't wuhk?"

"Not a stroke."

"Law, Mis' Carter, dat ain't do disease what you broth' got! Dat's a gif'!"

* * *

Some Giraffe!

A prominent circus man tells a tale of what happened when the circus train went into a ditch, and the Old Man offered the surrounding darkies a dollar each for bringing the animals back. The price was not good enough for one huge man who wanted it doubled for a giraffe he said he had hived back a ways. The Old Man hadn't missed any giraffe but he was willing to find out about it. He asked the darky if he was sure he knew what he was talking about. He was.

"Yassah, Ah is, an' it's a mighty savage giraffe, too. Done bite me twice on de laig. Ah ain't gona bring him in for no dollah. Ah wants two."

The Old Man gave him a dollar down, promising another on delivery of the goods. He took it and went away.

Next morning he came in looking as though some one had been cleaning fish on him—lacerated, bloody and lame. In one hand he carried a club about the size of his arm, in the other, and trailing over his shoulder, was one end of a rope.

At the other end of the rope, battered, half hairless, limp and utterly dejected, dragged a ten-foot man-eating Royal Bengal tiger.—Exchange.

* * *

The Sermon Hit Him.

A colored preacher was vehemently denouncing the sins of his congregation. "Bredern an' sistern, Ah warns yo' 'gainst he heinous sin ob shootin' craps! Ah charges yo' 'gainst de black rascality ob liftin' pullets. But above else, bredern an' sistern, Ah demolishes yo' 'gainst de crime ob melon stealin'."

A brother in a back seat made an odd sound with his lips, rose and snapped his fingers. Then he sat down again with an abashed look.

"Whuffo, mah fren'," said the parson sternly, "does yo' rar up an' snap yo' fingahs when Ah speaks ob melon stealin'?"

"Yo' jes remin's me, pahson," the man in the back seat answered meekly, "wha' Ah lef' mah knife."—Country Gentleman.

* * *

Each to His Trade.

Rastus was up before the magistrate charged with having stolen chickens from five different flocks. The court, after Rastus had pleaded guilty, expressed some surprise and not a little admiration for the old darkie's skill in getting away so often with the goods.

Rastus said nothing.

The court then said it would like to know how it was done, and even made some indirect mention of a light sentence in return for a full explanation.

But Rastus refused to rise to the bait. Instead he addressed the court in this manner:

"Yo' couldn't do it, jedge, nohow. Ef yo' tried, jedge, yo'd jest be dat clumsy yo'd get caught fust time. Ef yo' wishes to commit any rascality, jedge, yo' better stick to de bench wha' yo' am familiah."

* * *

If—

If a Hottentot taught a Hottentot tot
To talk ere the tot could totter,
Ought the Hottentot tot
To be taught to say "aught"
Or "naught," or what ought to be taught her?

Or—
If to hoot and toot a Hottentot tot
Be taught by a Hottentot tooter
Should the tooter get hot if the Hottentot tot
Hoot and toot at the Hottentot tutor?

—The Continent.

* * *

Set to Music.

"What did your wife say when you got home the other night?" "Not a word. She just sat down at the piano and played 'Tell Me the Old, Old Story.'"—New York Evening Mail.

* * *

NECESSITY A JUSTIFICATION.

The lady of the house was hurriedly finishing some work neglected the day before, when the old negro butler happened to pass by.

"Miss Ginnie! Miss Ginnie!" he remonstrated. "You shore is breaking the Sabbath day-"

"But, Uncle Clay," she argued, "the ox is in the ditch, and—"

"Miss Ginnie," broke in the old man, "that ox ain't nothing but a stumbling block for folks to hide behindst. The scripture do say if he is in the ditch to pull him out; but it don't nowhere say to push him in on Sat'day so as to have the chance to pull him out on Sunday."

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

296 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVI. JULY, 1916. No. 1.

CURRENT COMMENT.

In the right kind of advertising you don't spend money, you invest it.

* * *

The prospective home builder is the best prospect for pushing the sale of brick.

* * *

If somebody will just tell us what is the price of "peace at any price" we can soon be prepared to argue about it.

* * *

It looks like every time that dove of peace tries to settle down in Mexico somebody turns a blunderbuss loose at it.

* * *

If you prepare for an emergency before it happens it sometimes won't happen, but your preparedness won't be entirely wasted.

* * *

Clay flooring tile is a good item to push this year for there is room, by proper exploitation, to make a big place for it in porch flooring as well as in other work.

* * *

During the mid-summer vacation is a good time to plan what you want to do to interest the school children in the subject of brick when the next school term begins.

* * *

The fire hazard around the clayworking plant is not so great as around some other industries, but it is worth looking after just the same and safeguarding with proper insurance.

* * *

Already the industrial world is talking about and speculating on what it will do when the war is over. For one thing, we hope, there will be such an era of building as never was seen before.

* * *

The idle boaster is a sort of blank cartridge that makes a noise but brings down no game, and about the only good purpose he may serve is that of waking somebody with his noise that will do something.

* * *

The right idea in connection with the Building Brick Bureau is not that of spending money but of investing it for the sake of better returns in the future.

* * *

Those architects who used to shout for more variety in face brick ought to be in clover these days, for the face brick manufacturers have certainly developed variety.

* * *

Industrious cultivation of the near-by territory will help many a brickman enlarge his trade without going out and competing so sharply with his competitors in distant territory.

* * *

Every city that has experimented much with asphalt paving has had trouble enough with it that it should make a splendid opening for the success in pushing good brick as a paving material in the future.

* * *

Those Build With Brick posters and signs have accomplished so much in the way of good results that instead of letting up on it now the people should gather fresh enthusiasm and tack up more of them.

* * *

Good paving of any kind costs money, and the sooner municipal authorities realize that the spending of the right amount of money to get good paving is economical in the end, the better it will be for both the people that pay the bills and for the future of the industry.

* * *

We not only have almost every variety of clay in the world right here in our own country, but we have also successfully developed the manufacture of practically every known burned clay product. This makes clay products one thing that the United States can be absolutely independent in.

* * *

Forward! should be the watchword of the clayworking industry. There is not too much being made—even of face brick—but there has not been enough developing of uses. Let us boost the brick game till there is plenty of room for even more manufacturers.

* * *

It is strange how completely the system songsters have given way to the efficiency experts. It suggests merely a new edition of the same idea in different dress, and there is about it all an occasional reminder of the original idea of head work and hustle.

NEED BRICK MACHINERY.

Over in Spain they seem to be in need of some of our American brick machinery, with its greater capacity and labor-saving qualities. Consul Robertson Honey, of Madrid, Spain, writes that the building industry, one of the most important in Madrid, is enjoying considerable activity, but is threatened by a shortage of brick. He says brick is the principal material used and is made in small, primitive yards outside the city limits. There are no large yards, but many small ones, making a combined output in that section of 300,000,000 brick a year. Labor conditions seem to be bad for the time being and this, together with the scarcity of coal, is threatening to create something of a famine in brick. This is typical of what we expect to hear a lot more of in the older countries in the future, and somehow it seems to us that the need of Europe now, a need which will increase with the coming of peace and the days of reconstruction, is for American machinery to make more brick with less labor and to make better brick. So we feel that if the manufacturers of machinery here will take steps to get their offerings properly before people in the older countries we should be able to develop a big export trade in American brickmaking machinery.

FOLLOWING A GOOD IDEA.

F. H. Chapin, manager of the Hydraulic Press Brick Company, Cleveland, offered a virile suggestion when, in a paper read before the lumbermen at Cleveland during N. B. M. A. week, published in full in the April Clay-Worker, he advised that the brick manufacturers and lumber dealers co-operate with a view of rendering the best possible service to home builders. This idea has been suggested in the columns of The Clay-Worker a number of times. Mr. Chapin does well to follow up this good idea as he is doing by urging the Ohio Association of Retail Lumber Dealers to appoint a committee to co-operate with face brick manufacturers along the line mentioned.

The future will see many retail dealers making an important item of brick. Not only face brick, as is sought in this instance, but all kinds of brick, because the building of the future will include brick and lumber in the work and more brick than heretofore, so that the retail dealer in lumber must become a retail dealer in other building material, also, or else see his business dwindle. Meantime, through developing an interest in brick and clay products on the part of retail lumber dealers throughout the country, there will be formed a great addition to the selling force for brick that will help boost the game considerably.

Some idea of what may be done in the way of developing brick trade through this source is furnished by what has happened to cement. Ten years ago only one and six-tenths per cent. of the business of the retail lumber dealers was in cement. Today it is figured that 16 per cent of the dealers' business is in cement, which means that there is today just ten times as much cement sold by retail lumber dealers throughout the country as was sold ten years ago. Can we do something like this with brick during the next ten years?

FIRE BRICK IN THE HOME.

The amount of fire brick, blocks and of clay chimney or flue lining used in the building of an ordinary home is comparatively small and so insignificant that the requirements of the individual home itself would not materially interest the average manufacturer of clay products. When we take the aggregate, however, of all the fire clay products used in all the homes of the country it is a different matter and begins to assume that magnitude which calls for interest and attention.

The feature of this which it is desired to call the attention of manufacturers of fire clay products to at the present time has to do with the proper use of these products. The situation is such that it seems to call for some educational exploitation on the part of the manufacturers to the end that the public may get what it is entitled to from these fire clay products used in the home.

The average bricklayer, in building a home or building a chimney, when it comes to the chimney and fireplace part of the home, proceeds with practically the same material and methods that are followed in laying the wall brick. Not only are they careless in regard to flue linings and often in the building of the chimney around them, being neglectful of the proper use of mortar and the proper fitting and finishing, but the same order of carelessness prevails quite generally when it comes to putting fire brick and blocks into the fireplaces themselves.

The average mantel fitter will come to a new home being erected and have his helper make up a mortar either with cement and sand or lime and sand, which ever is the most convenient, and uses this in lining the grate or fireplace, not only disregarding the mortar requirements for laying fire brick, but making also big open joints, some of the mortar joints being half an inch thick and even three-quarters thick. The result is that one winter of hot firing will burn out a grate or a fireplace and the fire clay products must be reset or possibly, in some instances, replaced.

Every brick manufacturer who has ever lined or had lined a brick kiln knows that common clay even is better than a mortar made of cement and sand or lime and sand for laying up fire brick, and also knows that thin mortar joints are essential to the success in this product.

Now then, the proposition that suggests itself here is that this very subject should make a good feature for educational exploitation. The fire brick manufacturers could instruct not only bricklayers, but the home builders themselves, with advertising literature on how to use fire brick and other fire clay products to get the best service out of them. This kind of educational work should not only result in benefit and more satisfaction to the users themselves, but it should assist enough in the exploitation of these products to justify all the trouble and expense involved.

THE ALL-AROUND MECHANIC.

Thanks to the trade school idea, which many among the clayworkers have given both money and time of developing, and to the joining in along the same line of educators in general, vocational training is becoming popular, and the young man of today is taking to skilled work with enthusiasm which insures a better quantity of more efficient help in the future. The indications now are that this great idea is serving to avert what gave promise of being more or less of a calamity to the country, and that was the avoidance of physical work and manual training and the seeking for what was termed easier ways of making a living.

The tide has been turned now and the popularity of skilled work is setting in at a rate which gives promise of furnishing in the future plenty of skilled help in many if not all of the special lines of industry requiring careful physical training along with scientific teaching. Take the clayworking industry specifically, and there was long ago taken up and pushed forward to a successful issue the matter of educating young men in ceramics, and then following after that the industry has lent a willing hand to foster the training of young men in the trade of brick laying, so that this cause, too, has been well served, for it gives promise of more and better things than ever were known in the past.

But meantime, what of the all-around mechanic, the modern successor to Handy Andy? Every industry employing machinery, and this includes clayworking, has need not only for men specially trained in clays and their manipulations, but there is also a call for the all-around mechanic, who can do anything from lacing a belt to setting all the machinery in a plant, and do it right. There is some danger that we may overlook this point in manual training, that every man may specialize so much that we will run short of what for a better name we may term general mechanic. The object of the present article is to call attention to this point and to suggest that there be some special concentration on this idea until some satisfactory solution of the problem is found.

One thought that occurs in connection with it is that, while some young men are being trained in this special line and that special line, it should be worth while to give attention to the special training of some of the youngsters in all around mechanical work. It helps some to take a young man in tow as assistant to a millwright and let him gradually pick up ideas and experience that will qualify him to do the same work himself. This is hardly enough, though, and it is not in keeping with the spirit of the times. It savors too much of the old apprenticeship system, a thing we are rapidly leaving behind. The young man in this kind of position should have special instruction and the same kind of definite encouragement that is given those who go in for vocational schooling. It is a broad calling and involves a smattering of many different lines, including stationery engineering, blacksmithing, machine shop work, electricity, and especially electricity applied to power transmission, and, in fact, a working knowledge of practically all the trades that touch either directly or indirectly. The nearest type we have ever had to it is the old-fashioned millwright who was architect, engineer, general mechanic and everything else. His work is divided and sub-divided until millwrighting as we used to know it is almost a lost art, as every old-time clay worker realizes once in a while when he has occasion to overhaul his plant and put his machinery in order.

That is the whyfor of this appeal for special attention to training some of the young men into being all-around mechanics. The old millwright has gone his way because his field has been broken into by the architect, civil engineer, and the actual work subdivided between carpenters, other builders and boiler makers and machine specialists, who go to install and start up the different parts of the equipment of the plant. There is, though, continual need for a good mechanic of broader education and training than is involved in most of the specializing that is done in most of the teaching of today, and not only the welfare of the clay working industry, but that of many other manufacturing industries, depends on the training up of new, efficient men to fill this need. Let us keep this in mind in connection with the support and encouragement of trade schools and kindred educational enterprises.

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INDUSTRIAL EXPOSITION AND FAIR TO BE HELD AT EDGEWATER PARK, CLEVELAND, SEPTEMBER 2 TO 9, 1916.

There is to be an unusual industrial exposition at Cleveland the first week in September, at which it is figured there will be an attendance of a quarter of a million people. Many of those who had exhibits at the Complete Homes Show there last year have already secured space in the building show section, in which will be exhibited building materials and equipment of all kinds. Mr. M. A. Vinson, who took a leading part in the Homes Show, is managing the Industrial Exposition. Any of our readers desiring information in regards to same are requested to address him at 1393 West Twenty-fifth street.

EXPLOITING AT FAIRS.

Cleveland is getting the building material exposition habit. This time it is an industrial exposition and a fair to be held at Edgewater Park, September 2 to 9, 1916, under the direction of the Cleveland Chamber of Industry and Exposition Company, of which M. A. Vinson, who was actively identified with a big complete building show, is manager.

The thing of particular interest to the clayworkers in connection with this exposition and fair is that it includes a building material department as a feature with space 100 by 190 feet, which will furnish an opportunity for those clayworkers catering to the trade of the many people who are expecting to visit this fair, to do some exploiting of their product.

This effort at Cleveland is more pretentious than the usual state fair and on a considerably larger scale than county fairs, but it is in a way along the same order, and it reminds us that practically every year for many years now The Clay-Worker has made a plea for more active interest on the part of brick men in the matter of fairs and more active exploitation of brick and clay products at these fairs. This furnishes an opportunity to keep burned clay before the public, and every opportunity of this kind should be taken advantage of by those in a position to benefit from this form of advertising.

All those interested in the Cleveland Industrial Exposition and Fair proposition can secure any particulars they may desire by writing to M. A. Vinson, 1393 West Twenty-fifth street, Cleveland, Ohio.

NEW KAOLIN PLANT FOR GEORGIA.

Maynard & Simmons, geological, mining and civil engineers, Atlanta, Ga., have completed the design of the new washing and refining plant of the Savannah Kaolin Company at Gordon, Ga. Construction work is now under way, and machinery is being purchased. It is expected the plant will be completed within about sixty days.

This very valuable kaolin property was located by Maynard & Simmons. The prospecting of the property, the determination of the tonnage of kaolin present, and all factors relative to the commercial development of the property were investigated by Maynard & Simmons, in co-operation with Prof. Arthur S. Watts, of the U. S. Bureau of Mines, also with the Ohio State University.

Dr. Watts took up the physical investigation of these kaolins to determine for what uses they are best adapted. The association of Maynard & Simmons as geological, mining and civil engineers makes it possible to follow the deposit from its discovery to completion of the plant and production of the product.

This plant of the Savannah Kaolin Company will be unique among clay refining plants, in that the kaolin will be treated chemically, in order to obtain a very white product suitable for use in the manufacture of the highest grades of white ware. The production of a very white kaolin should make possible and sure the establishment of pottery plants in the Macon district.

The Highest Quality of Clayworking Machinery.

THE AMERICAN CLAY MACHINERY COMPANY

BUILT RIGHT RUN RIGHT

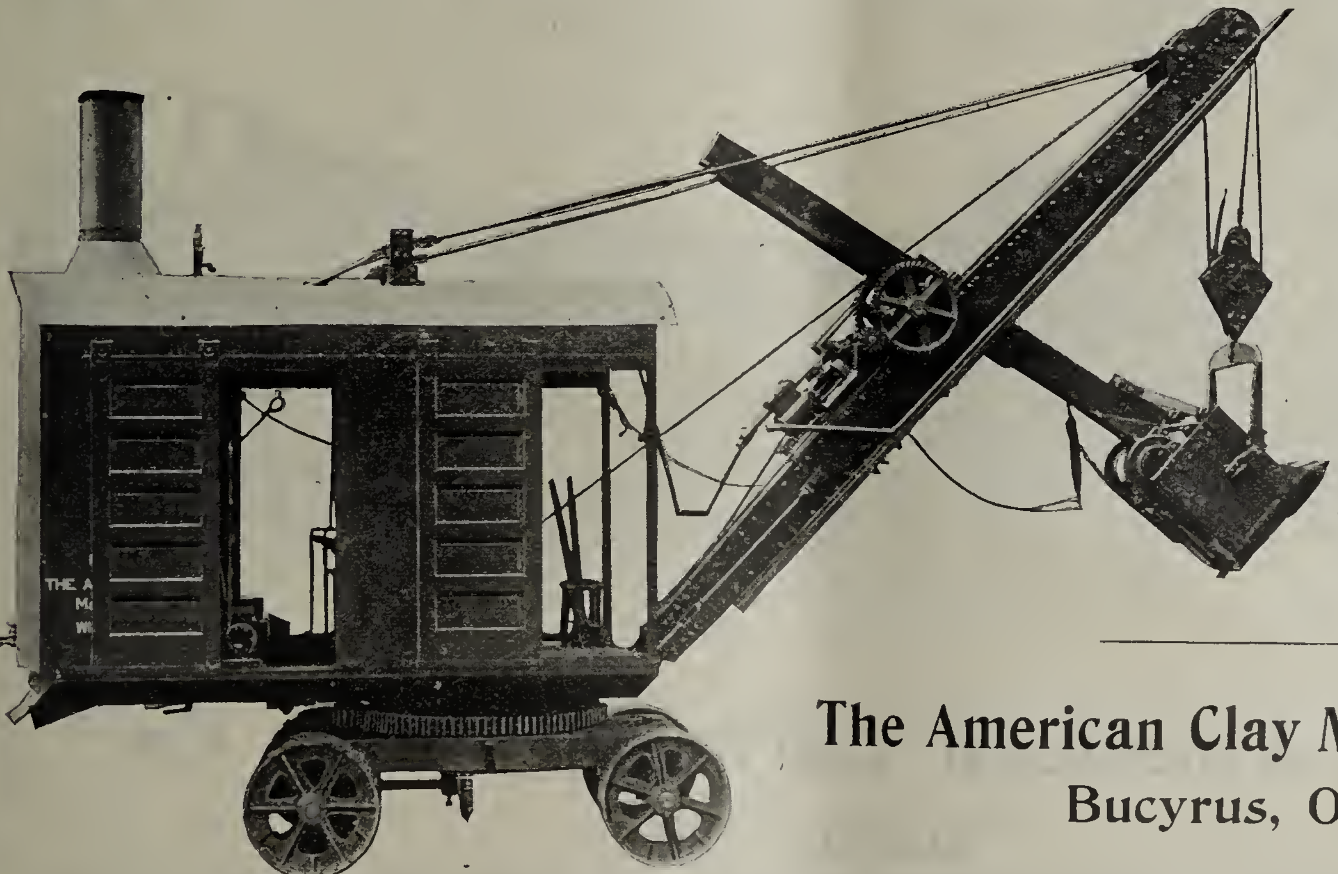
BUCYRUS OHIO, U. S. A.

Here is the picture of one of the most famous Haigh Continuous Kilns in the world. We will send you a description of it upon request, and will tell you just what it is saving in this plant. The Haigh Kiln will save you half your fuel and labor.

The American Clay Machinery Co., Bucyrus, Ohio

THE AMERICAN STEAM SHOVEL

This is a full seven-eighths yard shovel and is built in every detail to perform up to or beyond its capacity. It is as strong and substantial as shovels of larger capacity. It is compact, handy and easy to operate. It has a full swing, with ample power, and is moved about on its own power. It is a good hill climber, and is adapted for other work about the clay plant. Let us send you the facts, figures and photographs on this shovel.



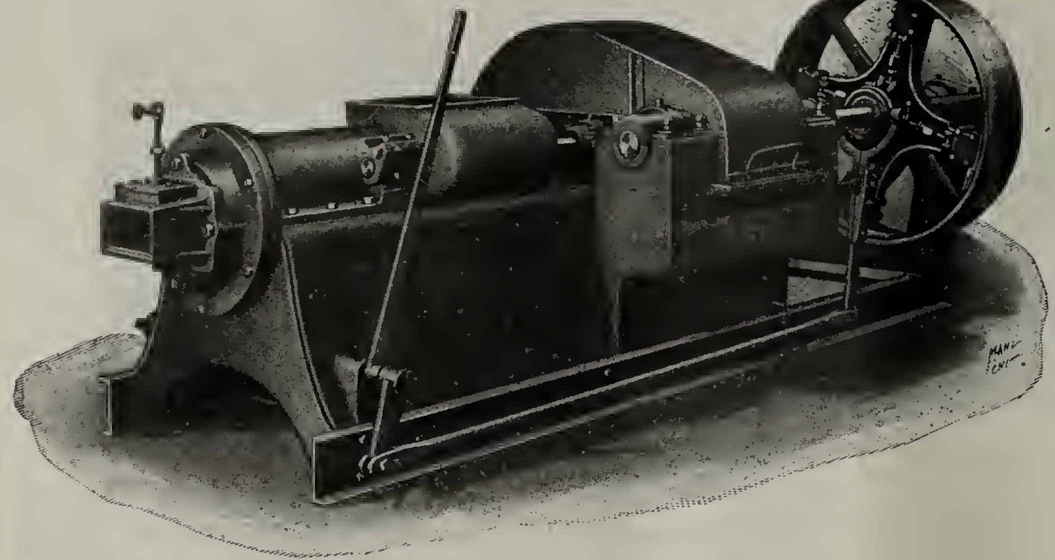
The American Clay Machinery Co.
Bucyrus, Ohio

Much the Largest Manufacturers of Clayworking Machinery in the World.

The Highest Quality of Clayworking Machinery.

THE AMERICAN CLAY MACHINERY COMPANY

BUILT RIGHT RUN RIGHT

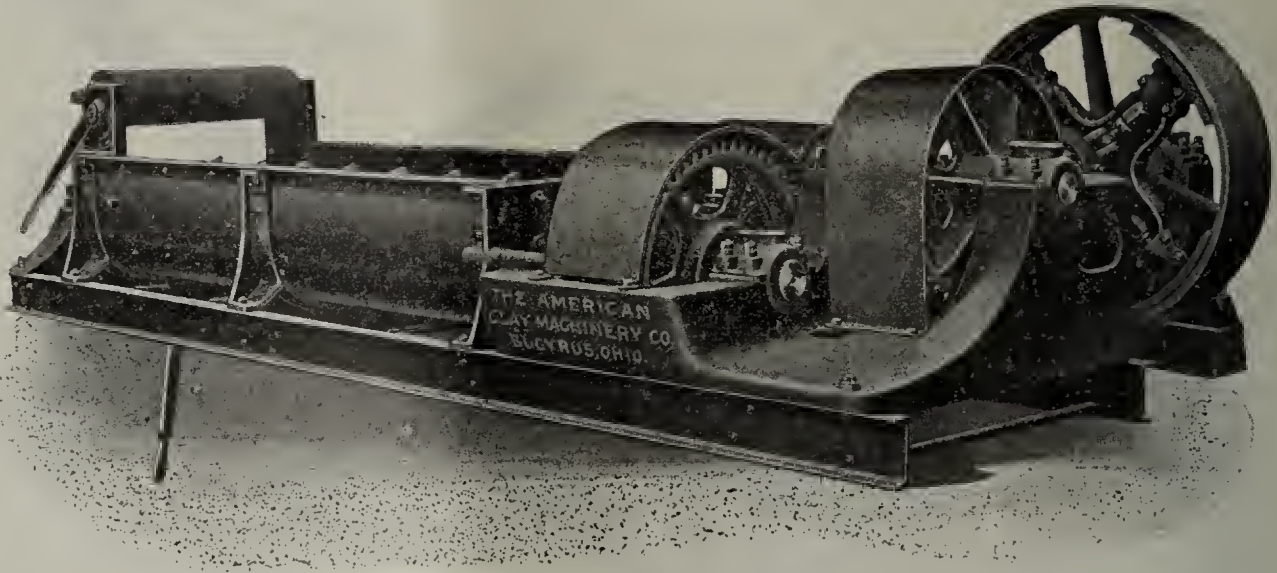


The American No. 233 Auger Machine

Here is a machine with a record back of it. It is superbly built and is sure to produce to your entire satisfaction. This machine possesses exclusive features, which will keep it operating to its maximum capacity without trouble. It is well proportioned and carefully built. It is suitable for the manufacture of brick, tile and hollow ware, and has a capacity for quantity and quality of product which can not be surpassed. Let us send you our bulletin on the American No. 233 Auger Machine. We have a copy for you. Let us have your request for it.

The American No. 247 Clay Feeder

This machine is designed for mixing and feeding plastic clay. The rapidity of feed can be regulated and the material will be fed in uniformly excellent condition. It can also be used as a double shaft pug mill. The standard machine is built with bevel gear drive, but can be furnished spur geared.



Full description given in the Bulletin on the No. 247 Feeder.

Send for it.

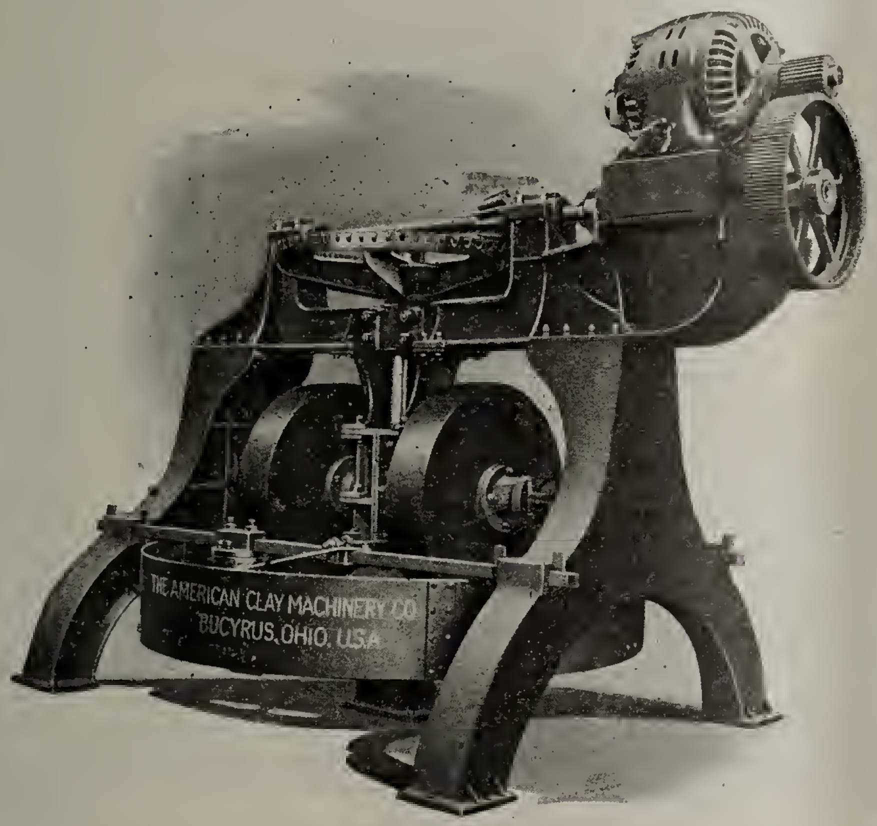
Built Right Run Right

The American Clay Machinery Co.

Bucyrus, Ohio.

THE AMERICAN CLAY MACHINERY COMPANY

BUILT RIGHT RUN RIGHT

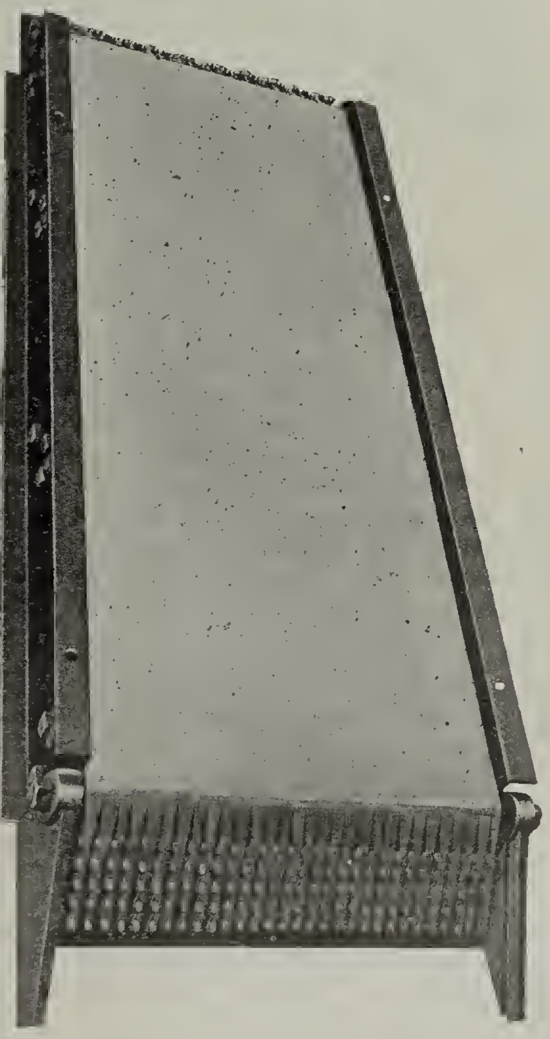


There is no plant in the world where efficiency of equipment counts more than in the Ford Motor Works. In the production of Ford cars every effort has been made to install efficient, reliable machinery with a quality that will keep it operating to its full capacity without delays. Delays in any department are vital, and so machinery is installed which will prevent delays.

The Ford Motor Works has just purchased two of the American Company's pans for use in their foundry, and have also purchased an American Piano Wire Screen.

Here is a testimonial of quality that should not be overlooked by the clayworkers of the country. Machinery MUST be right to get a place in the Ford plant. It is thoroughly investigated before purchased. If these pans will pass such a rigid inspection by the Ford organization, it is safe for the clayworker to depend upon the Ford judgment and install American Pans.

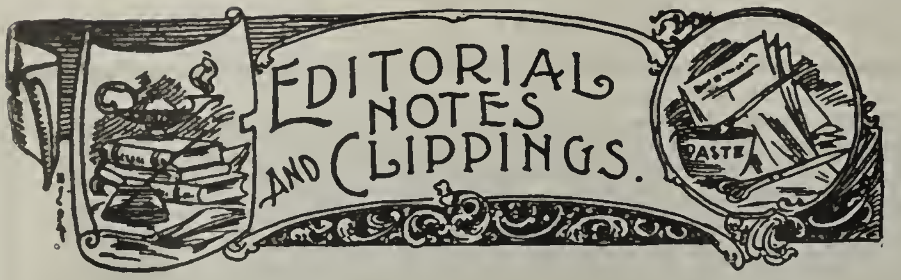
Let us send you our Pan Bulletin. It tells all about our pans.



The American Clay Machinery Co.

Built Right Run Right

BUCYRUS, OHIO



EDITORIAL NOTES AND CLIPPINGS.

The Monroeville Clay Products Company is planning the erection of a new plant at Monroeville, Ohio.

Calvin S. Jones, of Iola, Kans., is considering the establishment of a brickmaking plant at Parsons, Kans.

The Titus Clay Products Company, of Columbus, S. C., is building a large addition to its present plant, with a view of increasing the output.

The Gulf Cup & Still Co., Pensacola, Fla., manufacturers of seamless turpentine stills, will add the manufacture of clay turpentine cuts to their output, and are in the market for machinery for same.

The Long Island Brick Company, of New York City, has been incorporated, with $150,000 capital stock, to manufacture and deal in brick and other clay products. The incorporators are H. O. Coughlen, L. H. Gunther and Jos. P. Curtin, all of New York.

Fire which started from an overheated kiln at the brick plant of Hockers Bros., Green Bay, Wis., resulted in damage of $2,000. The yard is located midway between the towns of Green Bay and DePere and the fire had gained considerable headway before assistance could be rendered by the fire department of either town.

The Silica Brick Company, with capital of $60,000, has been organized by Henry W. Alport, Nathaniel McFadden and William T. Lego, to erect two $25,000 plants, one in Rockwood, Mich., and the other in Columbus, Ohio, in which it is proposed to manufacture a face brick of glass sand, which its promoters claim will revolutionize the brick industry.

The Houston Brick Works, of Houston, Tex., recently purchased 39 acres of land adjoining their present site, on which they will erect a dry press brick plant, which they will operate in connection with their present plant, which is now turning out 40,000 brick per day. A. T. Lucas is president, H. T. Lucas secretary and treasurer, and W. H. Lighthouse is manager.

The Smith Brick Company, of Omaha, Neb., has just closed a contract with the city of Omaha for moving 60,000 yards of earth for the purpose of opening up a street, and incidentally the brick company will convert the clay into brick, which should be used to build the new houses which will eventually go up in the territory thus opened up. J. Fred Smith, the head of the company, is one of the original boosters of the "Build with Brick" slogan.

The Roundup Brick & Tile Co., of Roundup, Mont., has purchased eighty acres of land, on which they will erect a brick and tile plant. The land contains not only a file clay deposit, but also extensive coal mines. Those interested in the company are H. H. Porter, M. M. Klein, W. R. Evans, W. E. Wynne and E. H. Blair, all of Roundup. The testing of the clay was done under the supervision of John J. Moroney, of Chicago. Work on the factory will be started by the first of August.

The Maryland Coal Company, having finished prospecting its property on Savage mountain, near Lonaconing, Md., for fire clay deposits, and having found a large acreage of both the Mount Savage flint and plastic clay, is now proceeding with extensive developments in connection with same. The company will install a modern fire brick plant and will manufacture all grades of fire brick, glazed tile, hollow tile, fire-proofing, sewer pipe, etc. In addition to this work, they are developing the Freeport seam of coal on the same property. This coal mine will supply the coal for the clay plant and the surplus will be put on the market. A separate company will be organized to handle the output of the clay plant, which will be known as the Maryland Clay Products Company. The present officers of the Maryland Coal Company, of West Virginia, and the Maryland Coal Company, of Maryland, are J. W. Galloway, president; Geo. Hewlett, vice-president; Jas. T. Russell, secretary and treasurer; J. E. McGowan, assistant secretary and treasurer; H. S. Rodgers, assistant secretary and treasurer, and they will occupy the same positions in the Maryland Clay Products Company. Louis N. Rancke, of Baltimore and Boston, is chief consulting engineer in charge of the work, and is located at Lonaconing, Md. A. F. West, of Baltimore, is the general contractor.

W. Benjamin Davis, 1 North Harvie street, Richmond, Va., writes that he is in the market for some clayworking machinery.

The General Refractories Company, with headquarters in the Trinity building, New York City, will build a brick plant at Joliet, Ill.

The Purington Paving Brick Company, Galesburg, Ill., report a very busy season. The output of their three yards totals 300,000 per day.

The Buffalo Clay Company, of Statesville, N. C., has been incorporated with $50,000 capital stock. The incorporators are E. R. Ramkin, F. F. Steele and E. G. Gaither.

Johnson & Johnson, of Raleigh, N. C., the largest brick manufacturers of North Carolina, will establish a branch office at Charlotte, N. C., with William D. Sloan in charge.

A new Virginia clayworking concern is the Glasgow Clay Products Co., which has been organized, with $100,000 capital, by C. H. and H. O. Locher, for the manufacture of brick and fireproofing blocks.

At a recent meeting of the directors of the Fulton Fire Brick Co., Fulton, Mo., it was decided to make extensive improvements in the plant, including the construction of two new kilns and a dryer.

For the first time in four years, the plant of the Duluth Clay Products Company, at Tower, Minn., is in operation. The plant has been overhauled and the company will soon be turning out 150,000 brick per day. The first brick made will be used to build the kilns.

F. D. Halsted, who has been secretary and treasurer of the Mount Union Refractories Company, Mount Union, Pa., since its incorporation in 1911, has retired. For eleven years prior to that time he was secretary and treasurer and general manager of the Queen's Run Fire Brick Company.

The Chattanooga Paint Company, Chattanooga, Tenn., announce to their friends and patrons the death of the president of the company, Mr. Albert E. Tucker, which occurred Friday, June 30. Mr. Tucker was a prominent, influential man in Chattanooga, and his death is a great loss to the community.

F. M. Whiting, superintendent, and Frank Cook, foreman of the Streator Brick Company, Streator, Ill., had a narrow escape from death, recently, when they were buried under a fall of shale. They were inspecting a steam shovel in the clay pit when, without a moment's warning, the great mass of clay fell on them. They owe their lives to the fact that a number of workmen were in the vicinity at the time and were prompt in the work of rescue. Mr. Whiting suffered a broken leg and Mr. Cook was badly bruised about the head.

The new plant of the Poston Brick Company at Springfield, Ill., is now in operation, turning out 30,000 brick per day. The capacity will be doubled when the plant is in full operation. A fancy rough face building brick, known as the "Postex Oriental," will be the chief output of the factory. The plant, which was built under the supervision of Mr. I. C. Poston, president of the company, is one of the most modern brick plants in the country. It is all electrically driven. J. C. Hale is vice-president and sales manager of the concern, and Emmett Z. Poston is secretary and manager. All of the men

(Continued on page 76.)

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

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MILWAUKEE, WIS.

TRADE B MARK

Barrett's PAVING PITCH

44th Street, Rock Island, Ill. Brick pavement filled with Barrett's Paving Pitch.

A brick pavement that will never crack

HERE is a brick pavement that never will crack. There are thousands of miles of such pavements in the United States. Even if a crack were started in one brick the crack can not spread to the next brick, for between the bricks is a filling of Barrett's Paving Pitch—a plastic, elastic compound. There is no rigid communication between the bricks.

If cement filler had been used cracks would have been more than possible. Cement links brick to brick in a solid monolith. If the foundation sinks or softens ever so slightly the bricks do not settle with it but bridge the depression and some day a heavy wagon breaks the arch and a long, unsightly and troublesome crack is the result.

The immense internal strain and stress in a monolithic cement-filled pavement cause many cracks. In a pitch-filled pavement there is no strain, for "every joint is an expansion joint".

The pitch in the joints of this pavement will last as long as the pavement, never needing renewal or repair, and during all the years will be unchanged in chemical and physical properties.

Pitch filler being a non-conductor of sound deadens the noise of a brick pavement and greatly reduces the nuisance of heavy traffic.

Booklets free on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
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MORE MONEY

There are just three ways for YOU to make money out of your plant.

Ask more money for the ware you are now producing—Competition won't let you—

OR

make your ware more economically. Make better ware and get the **Quality Price.**

Hook Down Draft Kilns will do **both** for you. Install Hook Kilns and get the highest possible percentage of first quality ware with less coal and in less time than with your present kilns.

Many clayworkers in different parts of the United States are already obtaining these results—So can YOU.

Don't wait until you build new kilns. Your first year's saving will pay the cost of changing your old kilns to this system.

We sell on a "Money-Back-Guarantee." We gain only when you gain.

Why not investigate this proposition NOW?

We furnish Kiln Bands & Grate Bars for All Types of Kilns.

HOOK PATENT KILN CO.
VIGO, OHIO
Canadian Office
250 Dufferin St. Toronto, Ont., Can.

EDITORIAL NOTES AND CLIPPINGS—Continued.

connected with the company have had many years of experience in the brick business, having started originally in Indiana.

The stables of the Columbia Brick Company at Washington, D. C., were badly damaged by fire recently. The loss is estimated at $850.

The United Brick and Tile Co., Tulsa, Okla., has been incorporated for $100,000 by John D. Richards, W. D. Abbott and B. A. Peek, and will establish a brick plant.

C. A. Goodheart recently purchased the brickmaking plant of Bross & Shearer, at Shippenburg, Pa. The plant will be overhauled and put in shape for operation.

After making extensive improvements, the plant of the Aetna Brick Company, at New Cumberland, W. Va., which has been closed for some time, has resumed operations.

The brick plant of Fred Brinkman at Arlington, Neb., was destroyed by fire recently, which started from an overheated kiln. The loss is complete, as there was no insurance.

Fire of unknown origin destroyed the large barn of the Kankakee Tile and Brick Company, Kankakee, Ill. The barn and contents were valued at $1,500, which were fully covered by insurance.

H. T. McLaughlin, proprietor of the Alsey brick and tile plant at Alsey, Ill., believes in the old maxim, "Practice what you preach," for he is building fifteen brick houses for the use of his workmen.

The Southern Sewer Pipe Company, of Birmingham, Ala., will rebuild the factory which was destroyed by fire some months ago. In addition to sewer pipe, the company will manufacture flue linings, etc.

The Federal Clay Products Company, of Mineral City, Ohio, has taken out a mortgage for $75,000 with the Guardian Savings and Trust Company, of Cleveland. The money secured will be used for improving and extending the plant.

The Wolf-Lanning Clay Company was recently incorporated at Dennison, Ohio, for the manufacture of clay novelties. Dr. E. A. Wolf is president; Theodore Lanning, vice-president, and A. Roy Lanning, secretary and treasurer.

The Southern Clay Company, of Sumter, S. C., with a capital stock of $75,000, has been commissioned by the secretary of state for the purpose of manufacturing clay and clay products. The petitioners are A. C. Phelps, R. L. Wright and E. M. Hall.

The Hercules Porcelain Company has been incorporated, with $75,000 capital stock, by Willis S. Brown, Sr., Frank S. Whitman, J. Frank Hunt, R. R. Brown and others, all of Indianapolis. The company will manufacture and deal in clay and clay products.

J. T. Barron, of Chicago, is erecting a large brickmaking plant at Roanoke, Ill., and will utilize the clay that is taken from the coal mines. The new plant is being erected on the site of the old Roanoke brick plant, which was partially destroyed by fire some time ago.

The Zoar Fire Clay Company, of Dover, Ohio, has increased its capital stock from $65,000 to $100,000, and the money secured from the sale of stock will be used to enlarge the plant, with a view of increasing the capacity. Dr. P. H. Sigrist, of New Philadelphia, Pa., is president of the company.

Alleging that the Adel Clay Products Company, of Adel, Iowa, has been infringing on his patent on frames for openings in buildings, David G. Johnson has filed a suit against the clay company, asking damages in the sum of $25,000. He also asks for an accounting of the profits of the company and an injunction to restrain the concern from using the patent.

Work has been started on the big plant of the National Clay Products Company at Shoals, Ind., which will have, when completed, a capacity of 60,000 paving and building brick a day. Edward E. Barrett is president; Adolph Levy, vice-president, and John B. Rice is secretary and treasurer of the concern. Wick Hunt is superintending the construction of the plant.

The Evansville Brick and Tile Company, Evansville, Ind., was recently incorporated, with $10,000 capital stock. The incorporators are Henry C. Kleymeyer, John Andres and Henry F. Kleymeyer, who are the owners of the Standard Brick Manufacturing Company, of Evansville. The new company will operate a plant located just east of the city, which, though now in operation, will be overhauled and modernized. The capital stock of the Standard Brick Company has been increased from $50,000 to $100,000.

William Lockhart contemplates the establishment of a brick and tile plant at Ruscomb, Ontario, Canada.

The Montgomery Shale Brick Company has been incorporated at Philadelphia, Pa., with $100,000 capital stock.

The Jones Clay Products Company, of Oak Hill, Ohio, has been incorporated by Joseph J. Jones and others, with $35,000 capital stock.

The Willis Brick Company, of Cincinnati, Ohio, has been incorporated by Robert J. Willis, R. Weber, Herman A. Bayless and others, with $5,000 capital stock.

J. S. Crump, Box 229, Morristown, Tenn., would like to receive information and prices on equipment for a small brick plant, including 50-h.p. boiler, engine, etc.

The Hand Clay Company, of Canton, Ohio, has been incorporated, with authorized capital stock of $5,000. The incorporators are C. Hand, J. M. Hand and V. H. Visscher.

The Richards Brick Company, of Edwardsville, Ill., recently purchased a tract of clay land adjoining its plant, consisting of 123 acres, thus insuring a supply of clay for many years to come.

Brick made at the Ohio state paving brick plant at Junction City, Ohio, will be used to pave 4.27 miles of the New Lexington-Athens road between Bendville and Moxahala, in Perry county.

The Whitehall Clay Products Company was recently organized at Whitehall, Ill., with the following officers: President, Frank Bridgewater; vice-president, C. E. Ruckel; secretary-treasurer, Carl Lowenstein. The company is having tests of clays made, and the site of the proposed plant will be determined after these tests are completed.

The Kutztown Brick Company, of Kutztown, Pa., has had a very busy season. They have made over half a million so far, nearly all of which have been disposed of for home consumption. Milton and John W. Boyer and John W. Rhode are the proprietors of the plant, and they expect to turn out at least a million more brick before the season closes.

The Moscow Fire Brick and Clay Company is the name of a new concern recently incorporated at Moscow, Idaho. The officers of the company are: President, F. S. Shoesmith; secretary, John Nisbet, and treasurer, Warren Truitt. The company is capitalized at $75,000, and announces that it is now in the market for a complete outfit of machinery, dryer, kilns, etc.

A new face brick firm has been organized at Detroit, Mich., by Frank L. Shafer, Edward G. Prout and Harry T. Jenney, under the name of the Frank L. Shafer Company. The new concern will deal in brick and other building supplies, and will open offices in the Kresge building. The men connected with the company have all had a wide experience in the sales end of the brick business.

The Harbison-Walker Refractories Company, Pittsburgh, is said to be doing the biggest business in its history. The company has issued a report of its financial condition for the six months ended March 31, which contains the following figures: Surplus after all charges and dividends, $739,543. This is a most excellent showing, in view of the fact that for the entire previous fiscal year the surplus was only $562,889, or almost $200,000 less. If the earnings of the company continue at the present ratio it would seem that the company will have at the end of its current fiscal year a surplus of approximately $1,500,000.

J. S. McCannell, president of the Milton Pressed Brick Company, of Milton, Ontario, Canada, has just completed a deal whereby the Milton Press Brick Company has absorbed two other large plants, the Toronto Pressed Brick and Terra Cotta Company, of Milton, and the Medina Shale Brick Company, of Streetsville, Ontario. Recently the Milton Company was incorporated, with $1,500,000 capital stock, and Mr. McCannell has been busy ever since completing the details of the consolidation, which makes the Milton Pressed Brick Company one of the largest clayworking concerns across the border. The main office of the company will be at Milton. Mr. McCannell is president and managing director; F. R. McCannell, vice-president. The other directors are J. P. Stillwaugh, J. McBain and W. B. Lummis. C. B. Lewis, for many years manager of the Toronto Pressed Brick and Terra Cotta Plant, will be retained as manager of that plant, and J. P. Stillwaugh, formerly of Hamilton, Ohio, will have charge of the Streetsville plant, which was constructed under his supervision four years ago.

THE USING OF

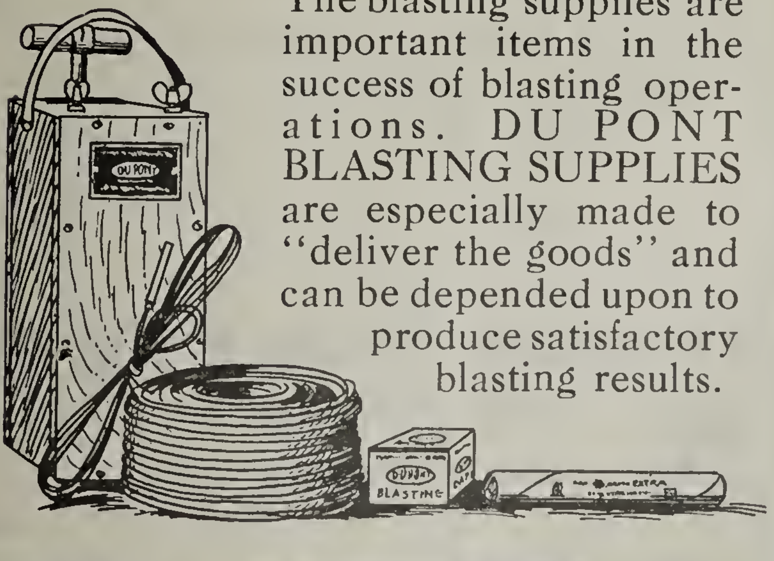
DU PONT EXPLOSIVES

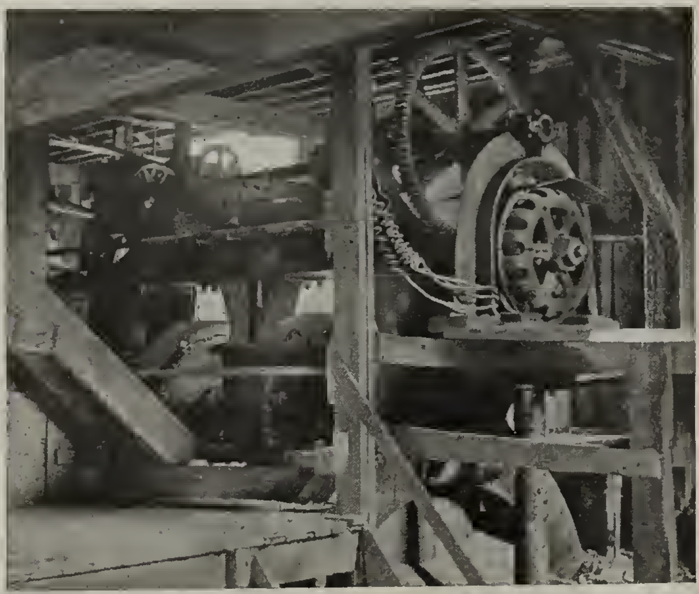
Will enable you to mine shale or clay of any variety of formation with greater speed, less waste and more satisfactory results than with any other method. We have prepared a booklet explaining the use of explosives in this work, covering the subjects, "Blasting Down Shale, Stripping Clay Pits, Mining Plastic and Flint Clays, Draining Clay Pits," etc. This booklet is a practical, helpful explanation of the methods used in the work, and will convince you that blasting is the best and most economical way of getting out your shale or clay.

SEND FOR A FREE COPY OF "EXPLOSIVES FOR SHALE AND CLAY BLASTING" BOOKLET NO. 296.

E. I. du Pont de Nemours & Co.
POWDER MAKERS SINCE 1802
WILMINGTON, DELAWARE

The blasting supplies are important items in the success of blasting operations. DU PONT BLASTING SUPPLIES are especially made to "deliver the goods" and can be depended upon to produce satisfactory blasting results.





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Are You Doing Something for Nothing?

Do you drive a long line shaft to operate a single machine? If so, you are paying power bills for nothing.

Westinghouse Motor Drive

will enable you to increase your output—save transmission losses—prevents a tieup from line shaft bearing trouble.

It will pay to investigate the possibilities of motor drive.

Send for Booklet 3072.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.
Sales offices in all large American cities.

THE FUTURE OF CERAMIC EDUCATION IN AMERICA.

(Continued from Page 28.)

or not, and if true, whether the explanations are the correct ones, I do not know. But I do feel pretty safe in one assertion, namely, that the American attitude toward life and our lack of social classification make our children very unwilling to spend effort in preparation for a career which is frankly secondary. Those who are willing to fit themselves by study at all, want to fit themselves for the best. Those who have not the ambition to go to the top, usually are content to stay at the bottom. We don't seem to hanker for the middle class—we Americans. And a trade school is frankly a middle class school. It cannot make leaders, except as it inspires its pupils to higher training than it itself can give. If I am right in my analysis of the American psychology, and its explanation of the failure of trade schools thus far to play any important part in the American educational system, then the potters in this country have some serious thinking to do before acting in the matter of ceramic education. If the white ware potters of America are right in thinking that they need the product of the trade school, to fill the vacancies at the bench, which the system of apprenticeship and unionism do not fill, then they ought to take it up seriously and in a very different way from that at present.

If the potters would unite to support day trade schools with two or three year courses, using the entire time of the pupils, and requiring one or two years of high school work for admission, or an equivalent amount of shop experience, and would make the training thorough and complete in the practical art, but with small pretentions to technical training, and would then resolutely back up such schools by apportioning their output into their plants, and making it clearly known that the route to foremanship lay through the school, they could in ten years' time have an entirely new attitude to the trade school in the industry. But they would have to finance the school, and they would have to back it up, and would have to carefully supervise its work, its plans and its teachers. It seems to me to be wholly possible, and if carried out would be of immense value, not only to your own industry, but as an object lesson to other industries of the whole country.

On the other hand, don't try to mix the trade school idea and the technical school idea. The difficulties of the trade school are great enough in this country, at present. A trade school and a technical school combined, or closely associated, is, in my opinion, out of the question, for it would tend to accent that very feature of the trade school which is most disagreeable to the American youth—its limited future. The man who is educating himself for an engineering or administrative position cannot profitably use the time required to gain manual skill and dexterity in an art. He can and must do enough manual work to know what it is, and when it is properly done; but his chief concern is to train his brain and ripen his judgment.

Summing up, I venture the following statements:

First. The experience of European countries and Japan has shown that ceramic schools of secondary grade, organized on the trade school plan, are useful under those conditions and among those peoples.

Second. The development of the trade school idea in general has been slow in America, and its success has thus far been very doubtful, although expensive experiments in a number of centers have been made to try it out. The cause of this seems to indicate a difference in the psychological attitude of the American people to trade education from what they show in other branches of education.

Third. The ceramic industries, especially pottery manufacture, which involves manual skill, decorative art and scientific accuracy, seem especially well suited to the trade school idea, and should make such schools successful in this industry, if in any.

Fourth. Such schools should be taken seriously if undertaken at all. They should be organized to give the training intensively, occupying the full time of the student. They must necessarily be located in great industrial centers, where pupils and local support can be had. They should be upheld by the industries concerned and fostered by employment and promotion of graduates to the limit of their value.

Fifth. Such schools cannot be expected to furnish the future leaders of the industry, to any large degree, at least, because the training cannot be made fundamental in science and practical in art in one and the same training period.

Sixth. The experience of over twenty years' trial in the United States, and a less period in other countries, has shown that technical schools of engineering and professional grade are just as successful in developing leaders for the ceramic industries as for any other, and indicate with great certainty that the management and control of these ceramic industries will ultimately pass into the hands of technically educated men, just as it has already done in the case of metallurgy and other branches of manufacture.

Seventh. The nature of the educational process in professional schools, being largely in development and training of the reasoning and analytical faculties of the mind and but little in the development of manual skill makes the location of such schools with relation to the industries they represent a matter of secondary importance.

Eighth. The development of the American ceramic industries, both for home use and foreign trade, demands the speedy adoption of every improvement and the enforcement of every economy which the trained engineering mind can suggest, together with the faithful and skillful execution of these plans by men who take pride in their work. A burden of responsibility from which those in charge cannot escape rests upon their present leaders. Patriotism and self-interest seem generally to travel by different routes. In this instance, they go together. Cannot our factory owners be made to see that education and training are the weapons with which the battles of industry will be fought hereafter, and that the victory will go to him whose mastery of nature's laws is most profound?

A JUDICIAL INQUIRY.

One of the justices of the U. S. Supreme Court is a gentleman of great height and correspondingly large proportions. Traveling to Washington in a sleeper one night, he became thirsty after retiring. He arose and sought the smoking-room for a drink of water. His majestic build and overpowering personality made him an awesome figure as he broke in upon a party of traveling men who were sitting up late to tell smoking-room stories. They shrank back rather guiltily because the justice in his white robe seemed a walking rebuke to low minds. They had been drinking, too—passing the water glass along with a flask of whiskey. The stern-faced intruder detected the odor when he drew a glass of water for himself and asked thunderously: "Who has had the temerity to drink whiskey out of this glass?" The company exchanged glances helplessly and no one could muster up the nerve to speak. The justice repeated the question and one drummer with a faint show of courage answered: "I did." The justice summoned another inch of height and drawing on the resources of his voice, exclaimed: "And where in Sam Hill are you hiding the bottle?"—Book of Smiles.

MENTION THE CLAY-WORKER
WHEN WRITING TO ADVERTISERS
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Gandy
Wears Longer and
Costs Less

"HAVE used it for years, and to my sorrow and expense, was once induced to purchase one of the 'just as good but cheaper' belts, with the result that this imitation belt only lasted me 108 days, as against 487 days' service obtained from the genuine Gandy."

The letter tells of increased service from Gandy Stitched Cotton Duck Belting.

In addition to the extra wear it gives, you should use Gandy Belting for the further reason that it is cheaper than other types of belting—its cost being about one-third that of leather, and about 25% cheaper than rubber.

It is proof against water, oil, dust, heat, gas or steam. It is guaranteed as to material, workmanship, uniformity and service, and is backed by 39 years years of successful manufacturing experience and the thousands of belts now in satisfactory use.

If you are in need of a belt, any size, for any purpose, write us for prices and samples.

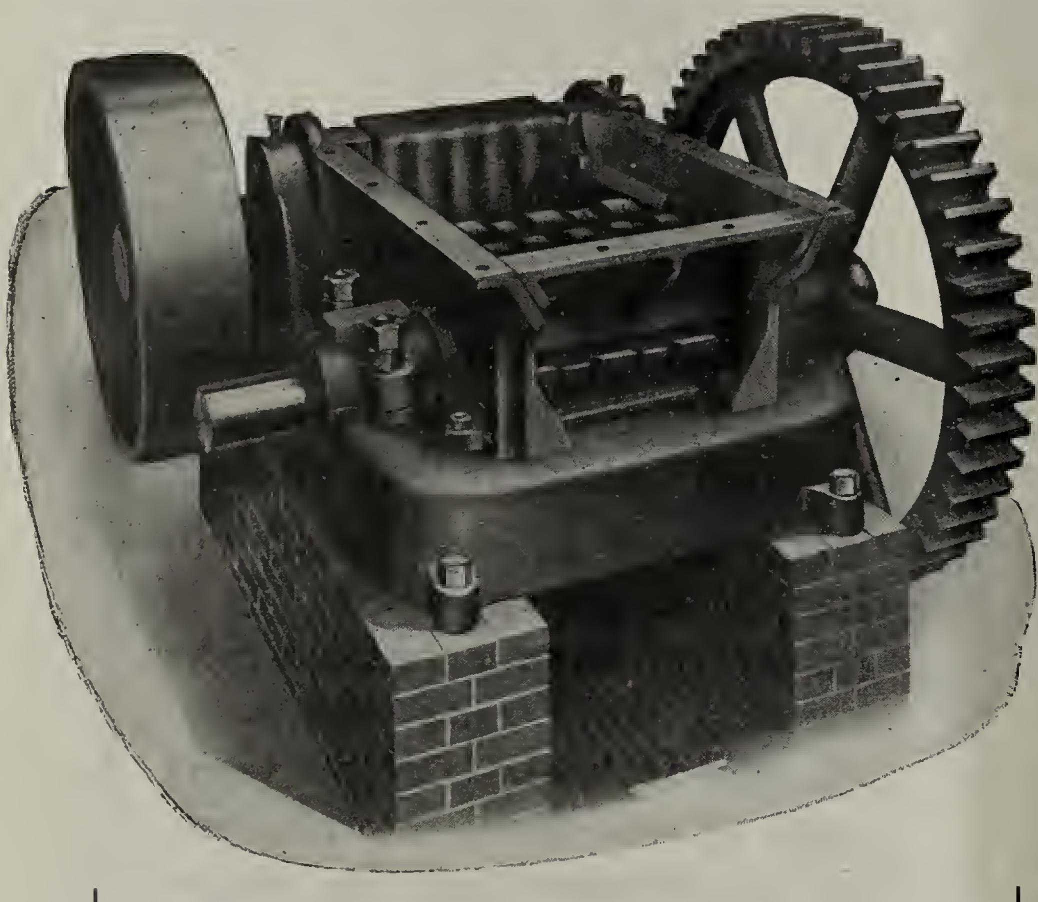
Gandy Belting Company
749 W. Pratt St.
Baltimore, Md.
New York Branch, 36 Warren Street.

While we are all more or less agreed that a dry pan is built to stand "the racket," and consequently abuse it infinitely more than we would an automobile or other finer or more delicate piece of machinery, yet it is easily possible to overtax its strength and capacity. Such a course must necessarily shorten its life, but not only this—it involves more cost for repairs and maintenance during its shorter life than if it is permitted to live its normal number of years.

How to prevent this business of overtaxing, you ask?

Simply by giving your dry pan the support of a

MECO SINGLE ROLL ROCK AND SHALE CRUSHER



Walkers Mills Stone & Brick Co., of Pittsburg and Walkers Mills, Pa., has this to say about it:

"It not only has enabled us to increase our output, but has been a great saving on our grinding pan. Before installing this crusher we were continually buying repairs for the pan, but since using the crusher we have had very few repairs. We put all the material, including large rocks, which otherwise would have to be broken up with sledges, through the crusher, and in that way get our material more thoroughly mixed, and of course are getting a more satisfactory brick."

In the face of such evidence as this we think it is time that you let us send a copy of our booklet on this crusher. A postal card request will do the work.

The Manufacturers Equipment Co.
The Clayworkers Furnishing House
Dayton Ohio, U. S. A.
Western Agent: Geo. H. Smith, 510 Reliance Bldg. Kansas City, Mo.

OF INTEREST TO SHIPPERS.

THAT the quantity of traffic being moved by railroads today is enormous, and the railroad facilities will be taxed to the utmost this fall, was the statement emanating officially from the Pennsylvania Railroad recently.

The Pennsylvania Railroad has instructed all of its freight solicitors to urge shippers to assist the railroads in their efforts to prevent any car shortage. The importance of prompt loading and unloading of cars is being impressed upon shippers, who are also being asked to co-operate with the railroads to prevent any congestion of traffic.

The Pennsylvania, in pursuance of its policy in such cases of taking early steps to preclude, if possible, any likelihood of a car shortage on its lines, is advising its patrons to have freight ready for loading when cars are placed on sidings, and is urging them to load all cars as near to capacity as practicable, in order to get the greatest possible service out of each car used.

The prediction by the Pennsylvania of a heavy fall traffic is especially interesting at this time, following, as it does, a statement just issued by W. A. Garrett, chairman of the Association of Western Railways, in which he makes an appeal to industrial traffic managers and commercial organizations. Mr. Garrett says:

"The time is here for the railways and shippers of the United States to begin active energetic preparations to prevent a car shortage. The indications are that if they do not begin such preparations at once they will be confronted next October with the worst situation that has existed since October, 1907, just before the panic. No railway man or shipper needs to be told what that situation was. Railway facilities were inadequate to move the business. Yards and terminals were congested, and heavy loss to the railways, the shippers, and the public resulted.

"Conditions that are likely to cause a heavy demand for and a rapid reduction in the supply of cars exist. The amount of traffic handled varies greatly during different parts of the year. During about four months, beginning around October 1st, there are apt to be shortages. This is owing chiefly to the fact that that is the season of heaviest crop movement. Now the crop prospects in the West this year are unusually good. That helps to make the prospect of a car shortage unusually bad.

"If the bad situation now threatening is to be averted, the managers of the railroads must have the hearty support and co-operation of the shippers and consignees of the country. The shippers and consignees can give such support and co-operation in at least two ways:

"By moving all lumber, coal, cement and other freight that they can within the next few weeks, instead of delaying and throwing it all on the railways when they are staggering under the crop movement. The commercial organizations of the cities and towns can help greatly by urging their members to move all goods as nearly as possible.

"Shippers and consignees can greatly help themselves, the railways and all other shippers and consignees, by loading and unloading all cars delivered to them as expeditiously as practicable. Every time the loading or unloading of a car is needlessly delayed, the available supply of cars is needlessly reduced, and no shipper has any right to complain that he is not furnished enough cars, if he is by his own acts needlessly and wrongfully reducing the available supply of cars. Commercial organizations can not render a better service to their members than by urging on them the need for prompt loading and unloading. Cars are furnished for transportation, not for storage, and every one used for storage reduces the number available for transportation.

"Shippers can help greatly by loading all cars to as near their capacity as practicable. The more freight there is loaded in each the less cars will be required to move all of the freight. There has been a great deal of talk in recent years about the need for better co-operation between railways and shippers. Here is a matter regarding which they can heartily and energetically co-operate to the very great gain of both."

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ORIGINAL BOSS SYSTEM

BOSS TEN-HOUR DRYER
Dries Easily the Most Tender Clays.
No Live Steam---No Drying at Night.

BOSS SYSTEM of BURNING BRICK
Use the Cheapest Slack Coal or Screenings
and Cut Your Fuel Bill in Half.

Write for Catalogs.

ORIGINAL BOSS SYSTEM
JOHN C. BOSS CO.
Monger Bldg., Elkhart, Ind.
ORIGINAL BOSS SYSTEM

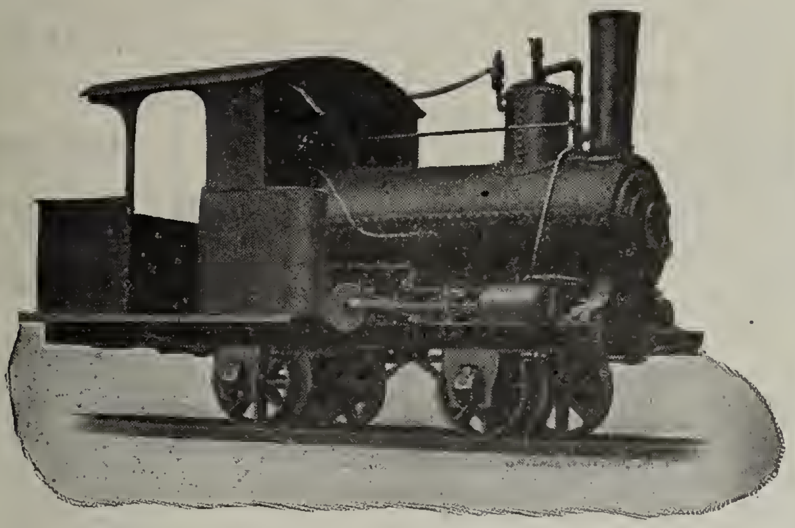
1916 ANNOUNCEMENT

We want a SWIFT SLACK COAL BURNING KILN and a SWIFT HOT-FLOOR DRYER in your vicinity. If there are none—to the first one answering this ad we will furnish one or both PLANS at a cost of the plans alone.

Drop a line to

SWIFT
Lock Box 269, OTTAWA, ILL.

INDUSTRIAL LOCOMOTIVES
TWO SIZES
5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

Classified Advertisements

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

BRICK PLANT FOR SALE.

Part or all. For information write
BARDIN ELECTRIC & POWER EXCHANGE, 3043 2nd Ave., So.,
7 tf dm Minneapolis, Minn.

FOR SALE.

Bonnot Brick Machine, cut off, pug mill and repress. First class condition.

Address BOX 133,
2 6 d Danville, Ill.

FOR SALE.

Bagley grader outfit, complete. In good running order. Will remove a pile of overburden, or very well adapted for grading. A bargain. Address

MINN.,
7 2 d Care Clay-Worker.

FOR SALE.

1 steam shovel, 1½-yd. dipper; built for heavy duty; 14 two-way side dump cars, 1½-yd. capacity, 24-inch gauge. All the above in good working condition.

E. J. LAVINO & CO.,
7 2 dm Plymouth Meeting, Pa.

FOR SALE.

Brickyard, stiff mud Chambers machine, situated about 12 miles from Newport News, on navigable water; about 30 acres land; good clay. Clay makes best brick in this section. Good reasons for selling. Best sort of term. Address

P. O. BOX 564,
7 3 c Newport News, Va.

FOR SALE.

Plant making paving, common, face and fire brick, building block, silo and drain tile.

Abundance of best shale, clay, fire clay and coal.

Equipment complete and running.

No near competition.

In the Middle West, Mississippi valley.

Fine city for home, with State University and Colleges.

This is all right, but owner cannot handle it; best of reasons for selling; controlling interest or all.

Small amount of cash will handle it.

D. W. S.,
7 2 d Care Clay-Worker.

FOR SALE.

A complete brick plant in operation. Been in the business twenty-nine years. Age compels me to retire. Address,

WM. SMITH & CO.,
452 East 3rd St.,
7 1 dm Middletown, Ohio.

FOR SALE.

Ninety-five acres red and white shale land within 20 miles of Toronto, Ont. Good shipping facilities. Two lines of railway. A bargain. Investigate.

A. C. ROBERTSON,
39 Russet Ave.,
5 3 cm Toronto, Ont., Can.

FOR SALE.

In the mid-continent gas belt, a paving brick plant, one of the best built with reputation for quality worth more than the physical value. Terms which will suit anyone looking for a paying investment. Business is good, prospects better. Address

BOX 6—KANSAS,
6 2 d Care Clay-Worker.

Chambers Brickmaking Machine

Second-Hand---50,000 Capacity

Now arranged for Side Cut Brick complete to end of die. New cutter required.

10-foot Pug Mill in good order.

Favorable prices.

CHAMBERS BROTHERS CO.
Philadelphia, Pa.

FOR SALE.

- 1 Stevenson 9-foot dry pan.
- 2 Richardson steam represses.
- 1 Bonnot steam repress.
- 1 American large size automatic rotating cutter.
- 1 Berg 4-mold dry press.
- 1 Means wood frame 9-foot dry pan.
- 1 Freese Union brick machine.
- 1 Freese automatic rotating cutter.
- 1 Hetherington rattler, almost new.
- 70 rack cars with steel pallets.
- Irons for hot-air dryer.
- 1 small concrete mixer.
- 1 Atlas engine, 14x26.
- 1 new piano-wire screen.

Address FRANK H. ROBINSON,
1230 Fulton Bldg.,
7 1 d Pittsburgh, Pa.

FOR SALE.

Two No. 36 American Ring Hammer pulverizers; run only a short time. Address,

L. L. STEPHENSON,
5 tf d Lovick, Ala.

WANTED, ETC.

WANTED.

Man capable of taking full charge of all machinery in brick plant making 100,000 per day. When writing give full information. Address

MACHINERY,
7 2 c Care Clay-Worker.

WANTED.

Position as manager or superintendent of clay works or brick plant. Have had wide experience in plant management. Correspondence solicited. Address

BOX 7—G. M.,
7 tf d Care Clay-Worker.

WANTED.

Quick. Good dry press machine, two-mold preferred. Would exchange good Eastern Kansas eighty.

D. M. FOWLER,
1501 Pennsylvania Ave.,
7 1 cm Kansas City, Mo.

WANTED.

Position as superintendent of sewer pipe, fire-proofing or brick plant; 28 years in the business, 18 as kiln burner. Can handle labor and give the best of references. Address

BOX 7—WISCONSIN,
7 2 cm Care Clay-Worker.

ATTENTION.

Manufacturers of enameled and slip-coated brick, terra cotta, faience, art ware and allied industries. Any problem you want solved, consult

H. A. PLUSCH,
Consulting Ceramic Chemist and Engineer, Perth Amboy, N. J.
7 1 c

WANTED.

Situation as superintendent of responsible concern. Have had over 20 years of practical experience in manufacturing common, vitrified paving, dry pressed and wire-cut face brick, also partition tile or hollow ware.

Can design and erect various types of up-draft, down-draft and continuous kilns, also direct and waste heat dryers and complete brick and tile plants. No. 1 references. Address,

BOX 6—LAKEWOOD,
6 tf d Care Clay-Worker.

Classified Advertisements.

WANTED.

An assistant burner for scove kilns. Booze fighters not considered. Address

MARSHALL BRICK CO.,
6 2 dm Marshall, Texas.

WANTED—TO PURCHASE.

Two hundred second-hand, double-deck, steel, drier cars. Give full description, name of maker and age. Address

BOX 6—MISSOURI,
6 2 dm Care Clay-Worker.

WANTED TO BUY.

One dry pan, 9 foot; one wet pan, 8 or 9 foot; one sewer pipe press. Give complete description, condition and cash price. Address,

LOCK BOX 727,
6 3 d Uhrichsville, Ohio.

WANTED.

A burner for a drain tile and dry pressed brick in round, down draft with horizontal grate. Easy work, night and day shift. Yellow plastic clay, burns red. Address

GLADBROOK PRESSED BRICK AND TILE COMPANY,
6 2 dm Gladbrook, Ia.

WANTED.

As a foreman for a brick plant in Tennessee, manufacturing 120,000 brick per day, a first-class, sober, young man, not afraid of a good, honest day's work, who knows how to handle men and who is thoroughly acquainted with the manufacture and burning of shale brick—one who has actually made good. Address,

BOX 6—TENN.,
6 2 d Care Clay-Worker.

EXCELLENT OPPORTUNITY.
WANTED.

Capital with personal service in developing paving brick industry in California. Market extends to all parts of State; is large and steadily increasing. Until recently no suitable paving brick shale was discovered in California. We have located an inexhaustible supply on railroad right of way, which has been thoroughly tested. Products sold to the trade. Samples of manufactured brick sent. No other known shale deposits in State, and will have practical monopoly. Full investigation is courted. Highest references will be given and required. Inquiry will show market already developed, and that bricks will bring price unheard of in East. This is a matter that will appeal to big men in the paving brick business. Substantial interest, with equal voice in management, can be obtained.

BOX No. 7—CALIFORNIA,
7 2 cm Care Clay-Worker.

WANTED.

Second-hand 9-foot dry pan and two 8-foot pug mills. Address

BOX 33,
7 1 d Findlay, Ohio.

FOR SALE CHEAP.

Brick and tile machine. Tile dies from 3 inches to 10 inches. Side and end-cut brick dies and hollow block die. Cutting tables, etc.

WM. McCUBBIN,
7 2 d Braymer, Mo.

WANTED.

As a foreman for a tile plant in Tennessee, who is a first-class, sober, young man, not afraid of a good, honest day's work, who knows how to handle men and is thoroughly acquainted with the manufacture and burning of sewer pipe and tile—one who has actually made good. Address,

BOX 6—PORT,
6 2 d Care Clay-Worker.

THE COAST LINE TO
MACKINAC

DETROIT,
CLEVELAND BUFFALO.
NIAGARA FALLS.

TOLEDO.
PT. HURON, ALPENA.
ST. IGNACE.

A REAL VACATION

The D. & C. Line Steamers embody all the qualities of speed, safety and comfort.

"D. & C. A SERVICE GUARANTEE"

Daily service between Detroit and Buffalo and Detroit and Cleveland. Delightful day trips during July and August, also two boats out of Detroit and Cleveland every Saturday and Sunday nights during these two months. FOUR TRIPS WEEKLY FROM TOLEDO AND DETROIT TO MACKINAC ISLAND AND WAY PORTS—June 25th to Sept. 10th, SPECIAL STEAMER CLEVELAND TO MACKINAC ISLAND. TWO TRIPS WEEKLY. NO STOPS ENROUTE EXCEPT AT DETROIT EVERY TRIP. Daily service between Toledo and Put-in-Bay, June 10th to Sept. 10th.

RAILROAD TICKETS ACCEPTED on D. & C. Line Steamers between Detroit, Cleveland and Buffalo, either direction.

Send two cent stamp for illustrated pamphlet and Great Lakes Map. Address L. G. Lewis, G. P. A., Detroit, Mich.

DETROIT & CLEVELAND NAVIGATION COMPANY

P. H. McMILLAN, Pres.
A. A. SCHANTZ, Vice-Pres. & Genl. Mgr.
Central Standard Time.

FOR SALE.

Complete brickmaking outfit, capacity 50,000 per day; 100-h.p. boiler, engine, pipe, track, etc. At a bargain.

HOWARD F. CROW,
1306 N. Third Street,
7 1 dm Philadelphia, Pa.

FOR SALE.

Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

T. A. RANDALL & CO.,
Indianapolis, Ind.

Elevator Buckets

We carry in stock at all times a large supply of Elevator Buckets, including Caldwell Seamless Steel, Regular Riveted and various styles of Malleable Iron.

All sizes and gauges for handling different materials.

Special Buckets made to order.

Send for Catalog No. 38.

H. W. Caldwell & Son Co.
17th St. and Western Ave.
CHICAGO, ILL.

NEW YORK: Fulton Bldg.
Hudson Terminal, 50 Church St.
117 Main St., Dallas, Texas.

MANGANESE

BEST QUALITY MANGANESE, CAREFULLY AND UNIFORMLY PREPARED FOR BRICKMAKING. WRITE US FOR SAMPLES AND PRICES.

NATIONAL PAINT AND MANGANESE CO.
LYNCHBURG, VA.

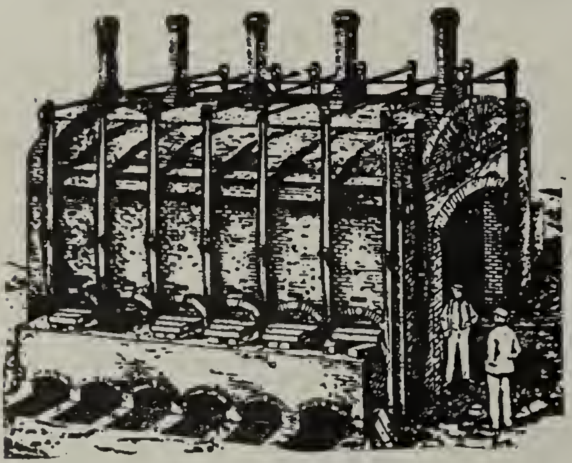
MINERS AND GRINDERS.

E. SCHMATOLLA

Consulting, Designing & Constructing

Engineer and Patent Attorney

To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares.
150 Nassau St., New York, U. S. A.



The Yates Patent Down-Draft Kiln Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

ALFRED YATES,
SHAWMUT, PA.

DENNIS SYSTEM OF KILNS AND DRYERS.

(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

Plans for tunnel dryers for either the car system or the Steel Pallet and Lift Car System.

For testimonials and further particulars address,

F. W. DENNIS,
1052 Bermuda St. Norfolk, Va.

Brick manufacturers who have anything in the way of second-hand machinery or appliances, will find a ready market for same through a card in our Classified Advertisements. Superintendents, yard foremen, burners, etc., desiring to make a change, will do well to run a Wanted ad in our classified department. Clay-Worker ads bring results.

TABLETS OF RECORD in Metal, Marble and Stone for Exterior and Interior of Public Buildings, Office Buildings, Banks, Churches, etc. Designed and Executed to Client's Instructions and Limit of Expense designated. Correspondence Invited.

Illustrated data and photographs sent on request.

J&R·LAMB

Studios, 23, 25, 27 Sixth Ave.,
New York.

The Parker-Russell Mining & Mfg. Co.

OAK HILL GAS RETORT AND FIRE BRICK WORKS

SAINT LOUIS, MISSOURI

Laclede Gas Building

Fire Clay and Silica Products of Quality for Service—Especially for Kiln Construction.

Books of Interest to the Clayworker

REFRACTORIES & FURNACES, by F. T. Harvard, E. M. Price $4.
Gives much valuable information relative to the properties, preparation and application of materials used in the construction and operation of furnaces.

CERAMIC GLAZES, price $10.00.
The book is remarkable for its systematic thoroughness, no more finely arranged charts of glazes in the way of careful gradations, coupled with extensive variations, could well be imagined.

Sold by

T. A. RANDALL & CO. (Inc.). Indianapolis.

THE STANDARD

INSURES YOUR MAIL BEING SEALED SECURELY AND NEATLY. YOUR MAIL CATCHES THE EARLY TRAIN

Table showing the comparative operating cost per annum between the STANDARD and any power sealer retailing at $100.00.

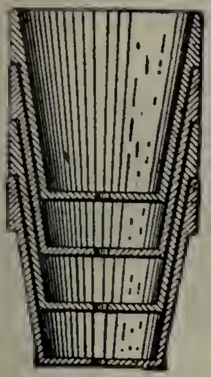
The Standard, Model F Costing $25		Any Electric Sealer Costing $100
$5.00	Depreciation based on machine becoming obsolete in 5 years	$20.00
2.50	Repairs, parts, etc., 10% of initial cost	10.00
0.00	Electricity, based on electric sealer being used only ½ hour per day at 10c per hour	15.00
1.50	Loss of interest on investment at 6% per annum	6.00
$9.00	Total annual operating cost	$51.00

Showing a difference of $42. per annum in favor of the STANDARD, equal to nearly double its initial cost. No allowance has been made in the above table for the fact that owing to its SIMPLICITY and EASE OF OPERATION, the STANDARD can be operated by YOUR MOST INEXPERIENCED OFFICE HELP. We are anxious to prove our claims in a competitive test IN YOUR OWN OFFICE AT OUR EXPENSE.

Write for Demonstration to

UTICA SALES & SPECIALTY CO., Inc., UTICA, NEW YORK

Mention THE CLAY-WORKER
When writing to Advertisers.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

1801 English Ave. INDIANAPOLIS, IND.

New Books Which Are Being Offered To the Trade:

HOLLOW TILE HOUSE, by Fred'k Squires, Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

CEMENT, CONCRETE & BRICK, by A. B. Searle, Price, $3.00.

A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

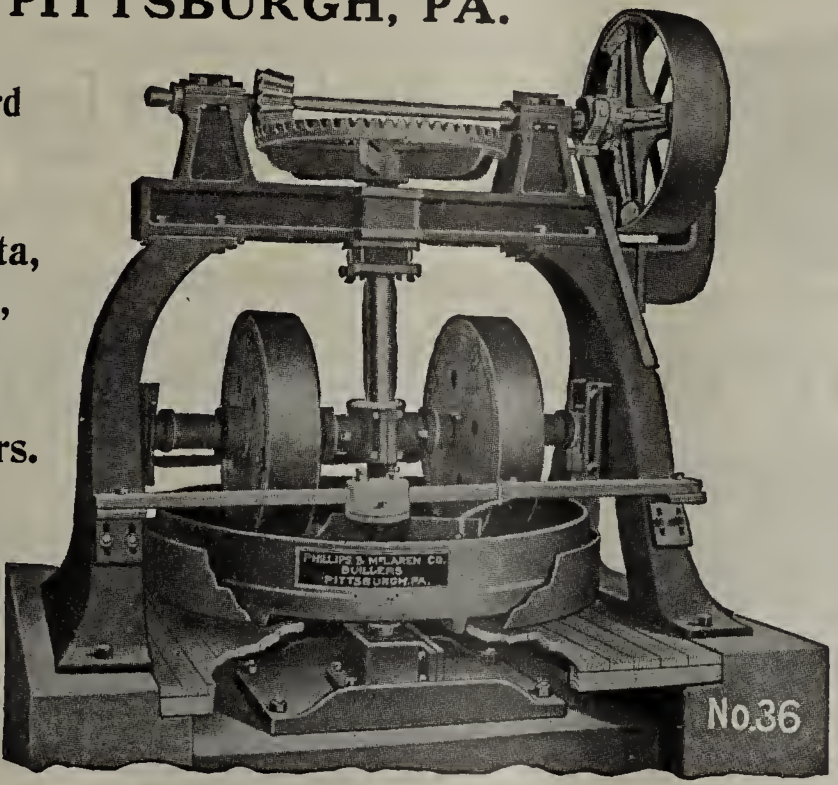
PHILLIPS & McLAREN CO.

PITTSBURGH, PA.

Builders of
Pittsburgh Standard
Dry and Wet
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office
Stephen Girard Bldg.
Philadelphia, Pa.



$2.00 *THE CLAY-WORKER* *ONE YEAR (IN ADVANCE)* **$2.00**

Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.

EASTON, PA., U. S. A.

Correspondence solicited.

Chattanooga Paint Co.,

Chattanooga, Tenn.

Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.

If...

You Want to Sell or Buy...

Second-hand Claywork-ing Machinery, Tile Mills, or anything pertaining thereto.

If... You Want a Man

for any position or a position in any connection with the Clayworking Trades use the

For Sale and Want Columns of...

The... Clay-Worker.

RATES

For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of seven words to line. Head line counts as two lines.

PYROMETERS

Brown Pyrometers will mean more uniform burning of your kilns, less fuel consumption, better ware. Why not install them as all progressive concerns are doing?

Brown Instrument Co.
Philadelphia, Pa.
New York Pittsburgh Chicago

Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special"
Clay Feeder

Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your off-bearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Soiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

The Old Way

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen. Lew Wallace, the author of "Ben Hur," wrote: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

ADDRESS THE CLAY-WORKER, INDIANAPOLIS, IND.

The New Way

Metallic Radiation Heat Dryers

PATENTED

Write for detailed information

IMPROVED KILNS AND DRYERS
KILN FLOORS AND FURNACES

Brick & Clay Engineering Co.
(Inc.)
5116 Walnut St. Philadelphia, Pa.

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)

Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

HOTELS STATLER

BUFFALO—CLEVELAND
DETROIT
Hotel Statler, ST. LOUIS, now building

Away from Home

MANY a man finds it difficult to be at his best when away from home. He is annoyed by little inconveniences, by unfamiliar surroundings which do not minister to rest and comfort, by service from people to whom he is only a buyer—and one of many.

Hotels Statler are equipped and operated with these thoughts especially in mind. Far-sighted provisions for the traveler's comfort and convenience are supplemented by a courteous, gracious, interested service.

Every patron of a Hotel Statler is an important man to us and his satisfaction is guaranteed.

Hotels Statler lobbies and public rooms are cheerful, luxurious and comfortable.

Rates from $1.50 Per Day

BUFFALO
450 Rooms
450 Baths

DETROIT
1000 Rooms
1000 Baths

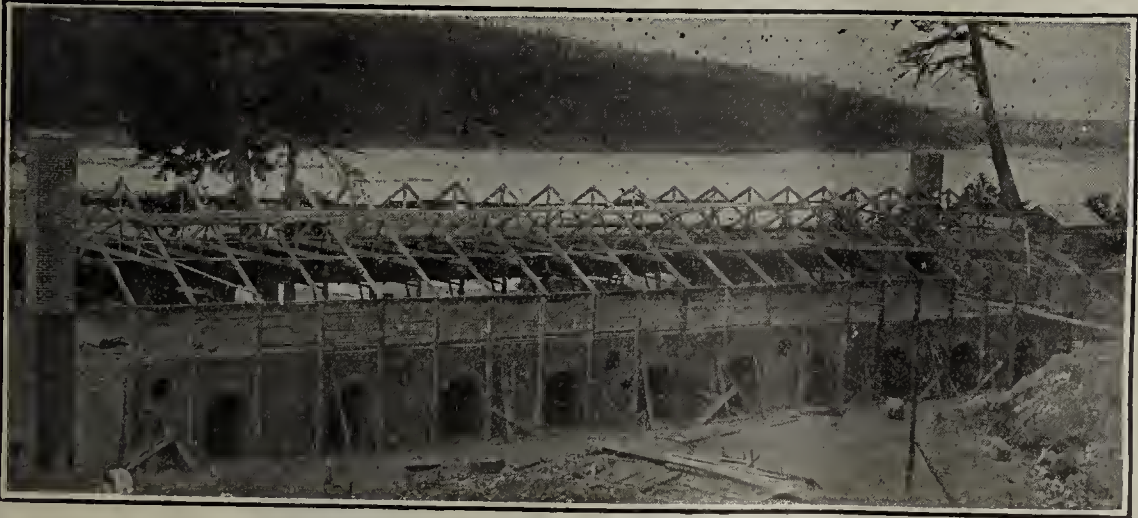
CLEVELAND
1000 Rooms
1000 Baths

The
ROESSLER-HASSLACHER
CHEMICAL COMPANY
100 William Street
NEW YORK

As a Preventative of Scums Use
CARBONATE OF BARYTES
R. & H. PRECIPITATED.

Oxide Tin,
Oxide Cobalt,
Red Oxide Iron,
Green Oxide Chrome,
White Oxide Antimony,
Black Oxide Manganese, and
all Chemicals used by the Clay Trades.

THE OREGON KILN



A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

HOOK'S

LATEST IMPROVED SYSTEM

For Burning Clay Products
MEANS SUCCESS

Scores of Brick and Tile manufacturers in the United States and Canada are burning their ware successfully with

LATEST IMPROVED HOOK PATENT UP and DOWN DRAFT KILN

In one section of OHIO where this latest IMPROVED KILN is best known, one of our representatives took orders for over

20 KILNS IN 3 DAYS

This evidence certainly favors the installation of THE UP AND DOWN DRAFT SYSTEM

Do not be deceived, insist on having HOOK'S LATEST IMPROVED PATENT KILN.

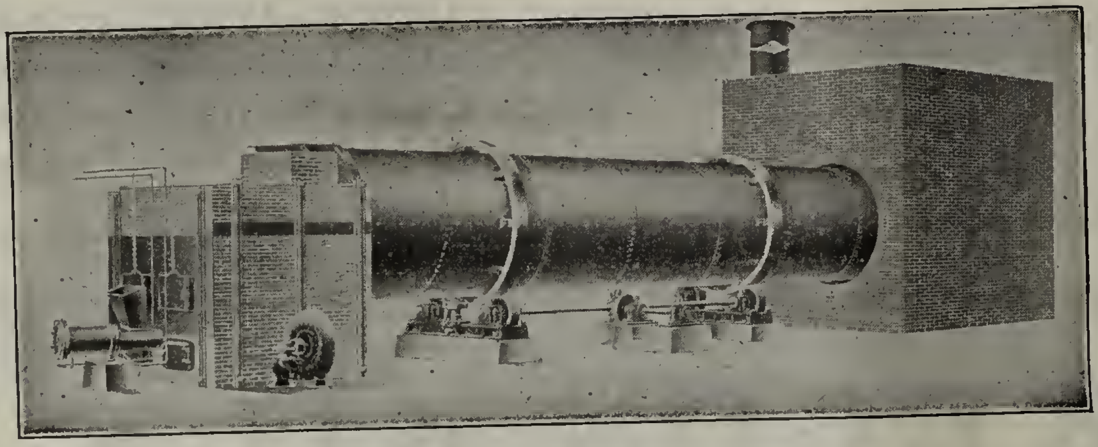
Sold only by

THE OHIO KILN CO.
VIGO, OHIO

We Can Save You Money, Time and Trouble on WIRES

Let us send you samples and prices.
Daily capacity, 20,000 finished wires.

The Mittler Wire Mfg. Co.
Robbins, Tenn.



ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

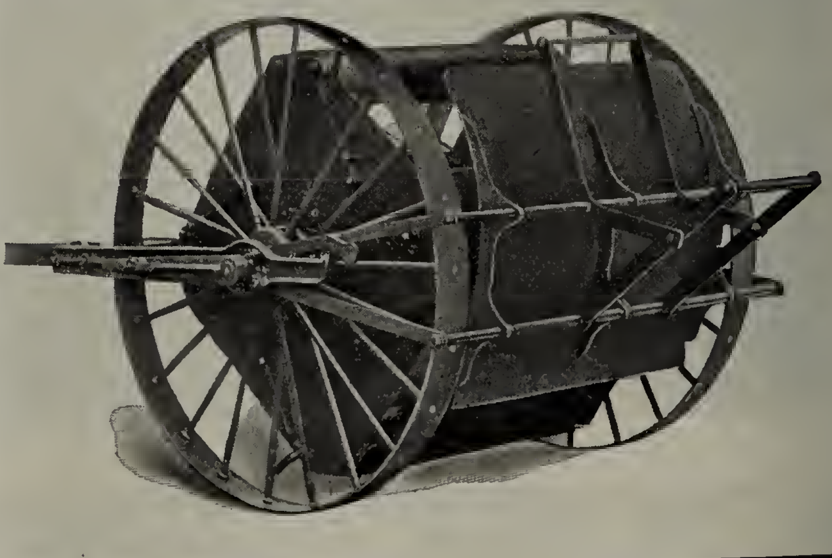
YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
NEW YORK

THE QUINCY IMPROVED GATHERER

used in connection with our SPECIAL CLAY PLOW is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
Quincy, Ill.



ELLIS LOVEJOY

Consulting Engineer

COLUMBUS, OHIO

◆ ◆ ◆

Geological Examination of Properties

Clay Testing

Investigation of Manufacturing Propositions

Plants Designed, Construction Superintended and Operations Directed

Dryers, Furnaces, Kilns

Remodeling Old Plants Given Special Attention

Development of New Lines of Products

Appraisal of Plants

MR. CLAYBURNER

If you reduce radiation from crown and walls of kiln you save time and fuel. If you increase life of linings and prevent rust and corrosion on dryer cars, fans, pipes, etc., you save costly renewals. You can do these things with Carbide Coating at a nominal cost.

You may not believe that a coating or paint will protect linings. You, however, believe that salt glaze or a vitrified surface protects pipe and brick. Well, the pigment in Carbide Coating will endure heat that will burn up, vaporize fire brick and the vehicle or binder is the same article you get in salt glazing at the vitrifying temperature. The combination forms a composition which will protect linings, reduce radiation and protect metal from acid, sulphur and other corrosive fumes.

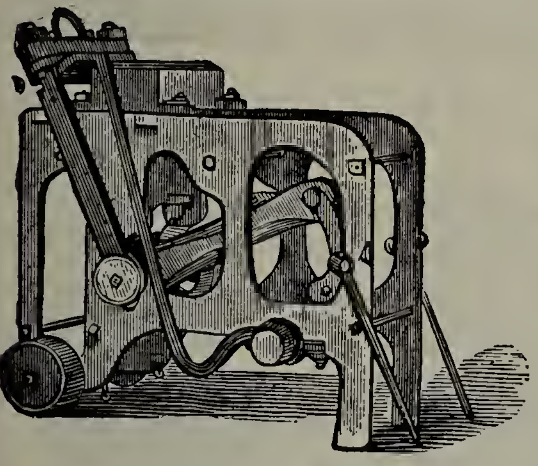
I will be very glad to show you how you can use this to advantage. Address,

E. R. STOWELL,
Oden, Mich.

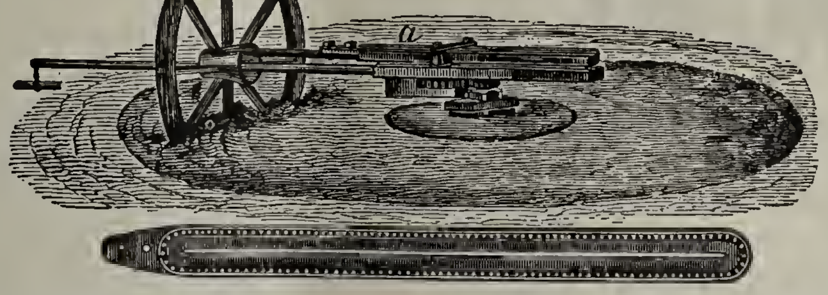
Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



RED BRICK PRESS.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

DO YOU KNOW

that in the BURNING OF BRICK a DRAFT GAGE is of greater advantage than a PYROMETER? We furnish both.

DO YOU KNOW

that for many years we have made the BEST DRAFT GAGES for all styles of kilns?

Write us for information of all kinds of controlling apparatus for clayworkers.

Ceramic Supply & Construction Co., Columbus, Ohio

"Nothing Succeeds Like Success"

THWING

HIGH RESISTANCE MULTIPLE RECORD

PYROMETERS

Have been placed in

EIGHT MORE

CERAMIC PLANTS

Since the Cleveland Convention

Are you interested?

Let us tell you about it.

Thwing Instrument Company
439 N. Fifth St.
PHILADELPHIA, PA.

The Three
Cardinal
Virtues in All
Brickmaking Equipment

EFFICIENCY
ECONOMY
STABILITY

These you have in the highest degree in Brick Drying in

THE NATIONAL DRY KILN

INDIANAPOLIS, IND.

Write for Catalog,
mentioning The Clay-Worker.

ECONOMY True economy is the sure road to wealth today, just as it has ever been. This is generally conceded, but it is not always certain what constitutes true economy. In the clay line it is ofttimes real economy to replace small capacity machinery with larger in order to meet the demands of a rapidly growing trade. Really it is false economy not to do so, for one must spend money to make money. He is wise who recognizes this truth and promptly replaces outgrown machinery with that equal to his needs. Then, after you have done the wise thing in enlarging and refitting your plant, don't let the outgrown machinery go to the scrap pile. It may prove a boon to some manufacturer starting a small capacity plant for which it will be ample. There are many such and they may be reached through an ad in the For Sale columns of The Clay-Worker. Be wise, not wasteful, and instead of letting your outgrown machinery rust out, advertise it in The Clay-Worker (see forms of ads under heading "For Sale, Wanted, Etc.," in this issue) and convert it into **CASH**

To insure insertion in current issue, copy should be furnished early in the month.

Address

THE CLAY-WORKER,

Indianapolis.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

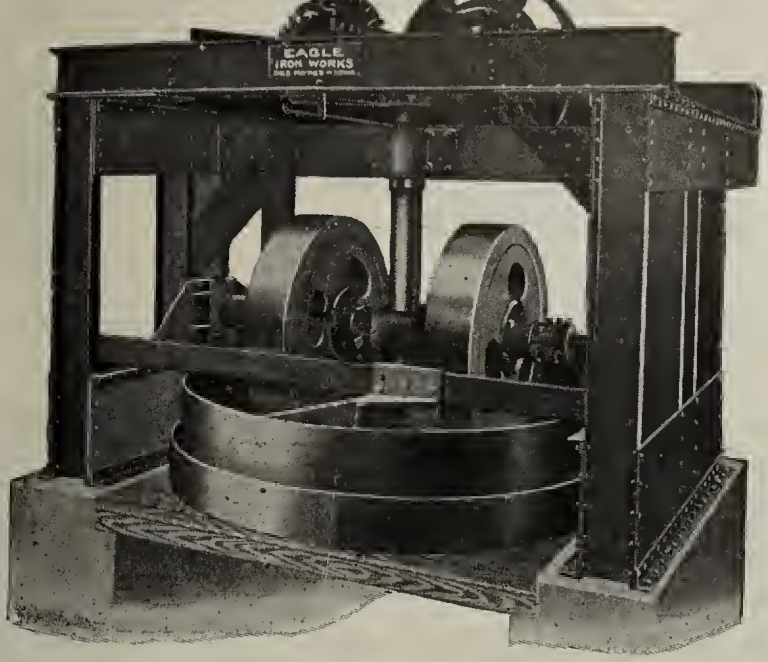
Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

A New Candidate for Favor! Right in Every Way!



The 8 Foot Steel Frame Dry Pan

Built by the

EAGLE IRON WORKS
Des Moines, - Iowa

1,653,000 Cubic Yards in 24 Years

Clay for 264,000,000 Brick in 9 Years with Type 0 Thew.

Clay for 397,500,000 Brick in 15 Years with Type 3 Thew.

Clay for 31,000,000 Brick in 1916 with Type I Thew and but half a day's delay during the year.

Twenty-four years of service and still operating and the owner writes: "The shovel is not very handsome to look at but it does its work without any trouble. We can't say anything too good for the shovel or for The THEW COMPANY."

Over 300 Brick Manufacturers own THEW SHOVELS and will bear similar testimony.

239 Thew owners have given repeat orders.

In the face of such testimony, can you afford to employ old methods and have your output reduced by inability to get men enough in the clay pit to keep your plant running to capacity?

A Thew shovel would save you time, money and trouble, increase the output of your plant and improve the quality of your product.

Circular 22-F shows you why and gives valuable data. It is yours for the asking.

INVESTIGATE THE THEW. IT PAYS.

The THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Land Drainage, by J. L. Parsons. Price, $1.50.

A treatise on the design and construction of open and closed drains.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

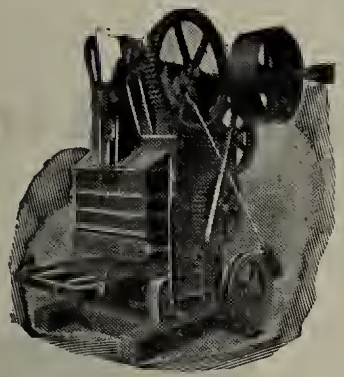
Drying Brick, by W. D. Richardson. Price 25 Cents.

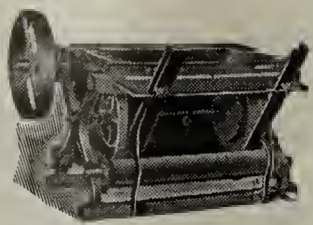
A little booklet giving and explaining the various styles of dryers, etc.

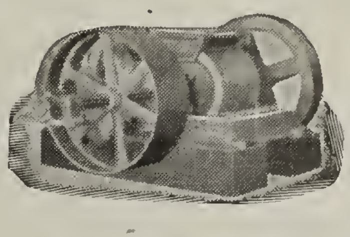
T. A. RANDALL & CO.

Indianapolis, Ind., U. S. A.

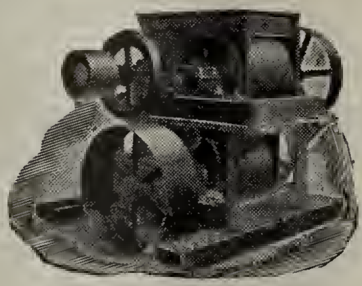
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

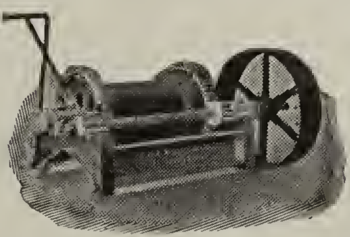

Vertical Brick Machine


Style "A" Mould Sander


Style "P" Roller-Crusher

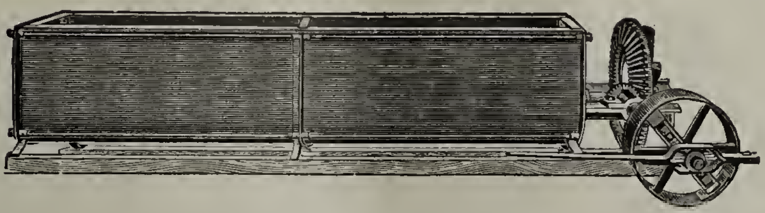
Style "A" and "P" Disintegrator

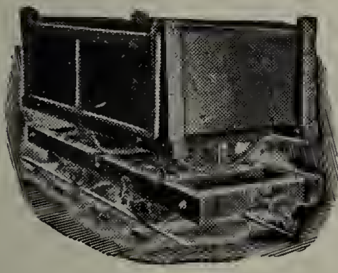

Style "P" Compound Disintegrator and Crusher

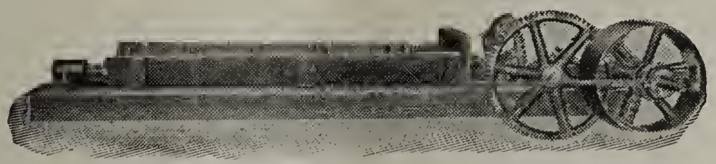

Style "B" Winding Drum

Mule Truck

Double Geared Pug Mill

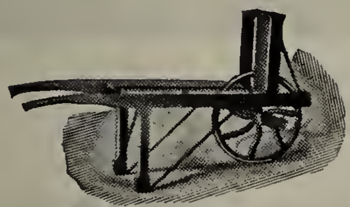

Single Geared Pug Mill

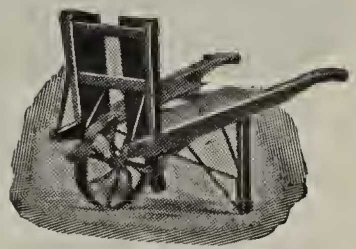

Side Dump Car

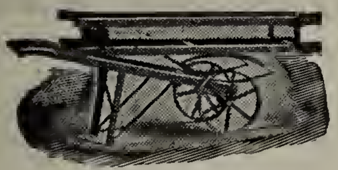

Feeder or Granulator

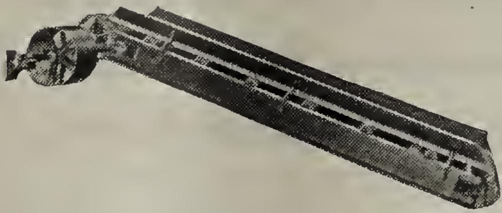
Bottom Dump Car

The Potts Rocker Grate
For any size fire box on boiler or kilns


No. 6 Barrow


No. 2 Barrow


Double Deck Truck


Clay Elevator.

Single Deck Truck

C. & A. POTTS & CO.
INDIANAPOLIS, IND.

Write us for Prices.

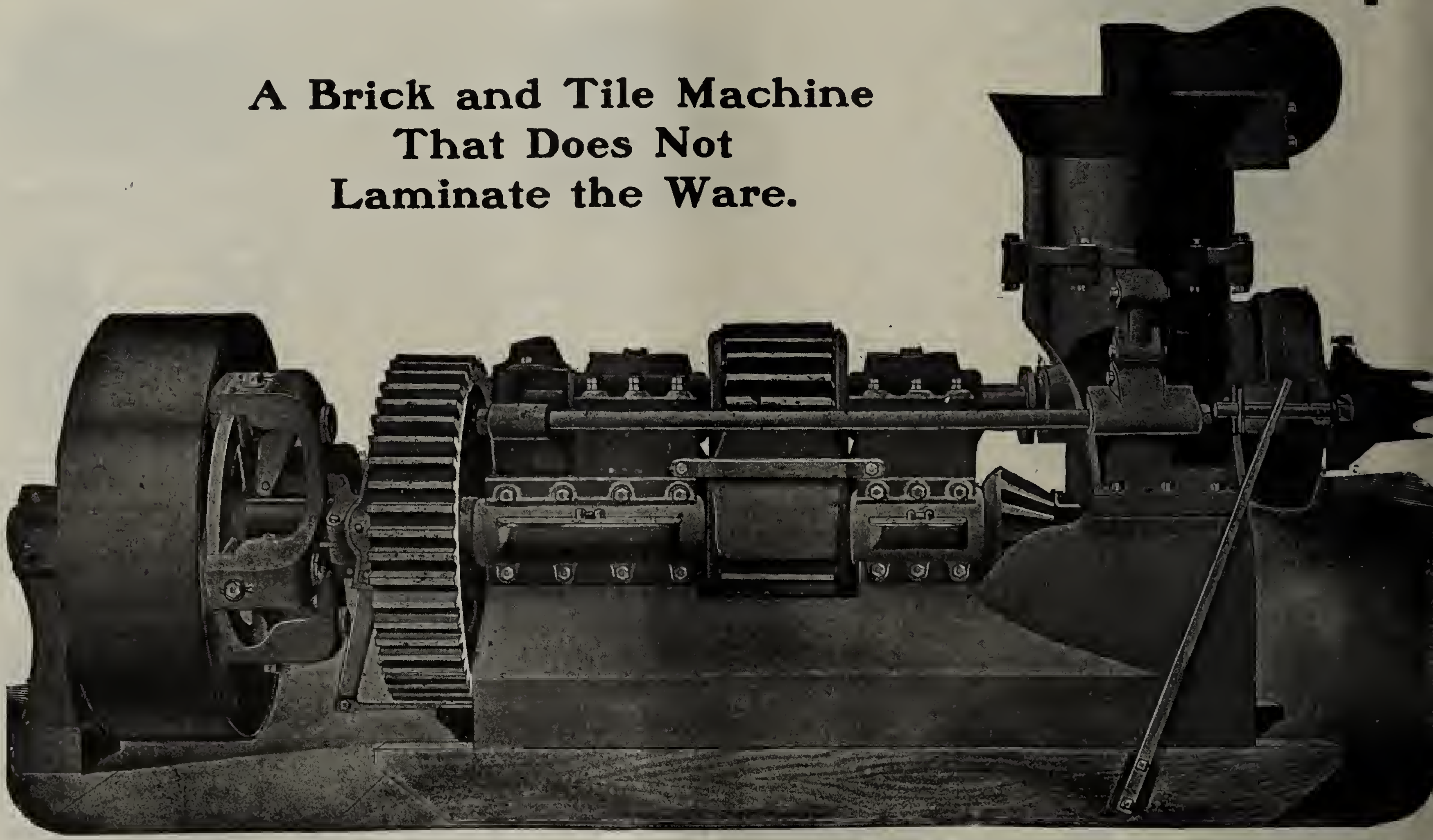
If it's to be Had We Have it.

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

A Brick and Tile Machine
That Does Not
Laminate the Ware.



The Big Wonder Brick and Tile Machine

We also make Side=Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

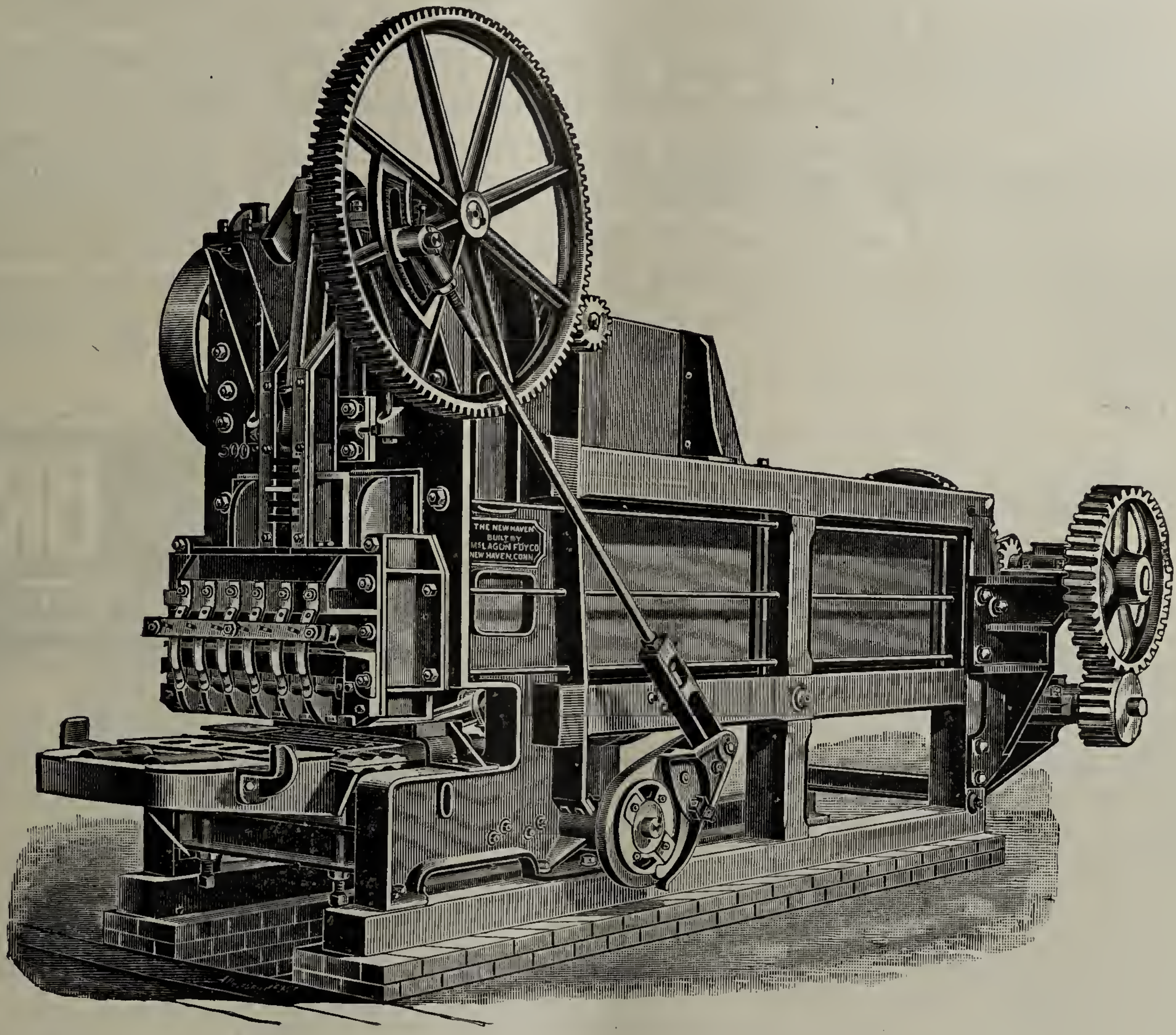
Write for Catalog and Prices.

THE WALLACE MFG. CO.

FRANKFORT, IND.

There is a Standard in Everything

In soft mud brick machines the New Haven is the Standard. Equalled by few and surpassed by none. The New Haven Machine is built to last.



"NEW HAVEN" HORIZONTAL BRICK MACHINE.

This machine is built for service and has never failed to make money for the purchaser. As an evidence of this more than three-fourths of all the brick made in New England, the home of the New Haven Machine, are made on New Haven Machines. Write for catalogue.

The EASTERN MACHINERY CO.
NEW HAVEN, CONN.

JOIN THE

BOOST **BOOST**

BUILD WITH BRICK

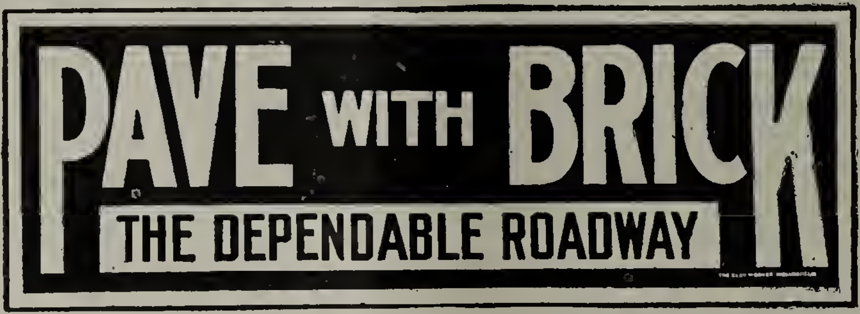
CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

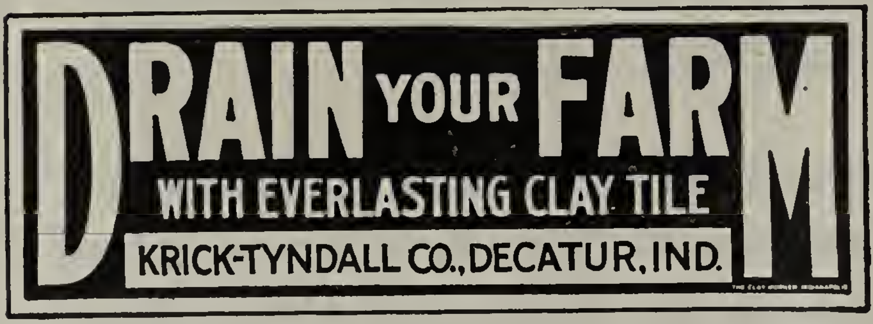
THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

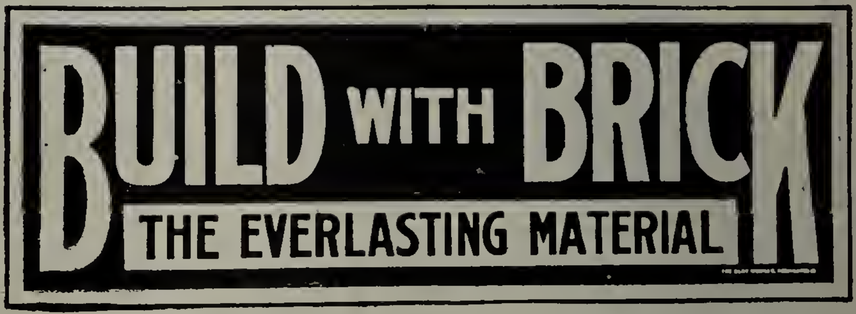


It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.



Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.



T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

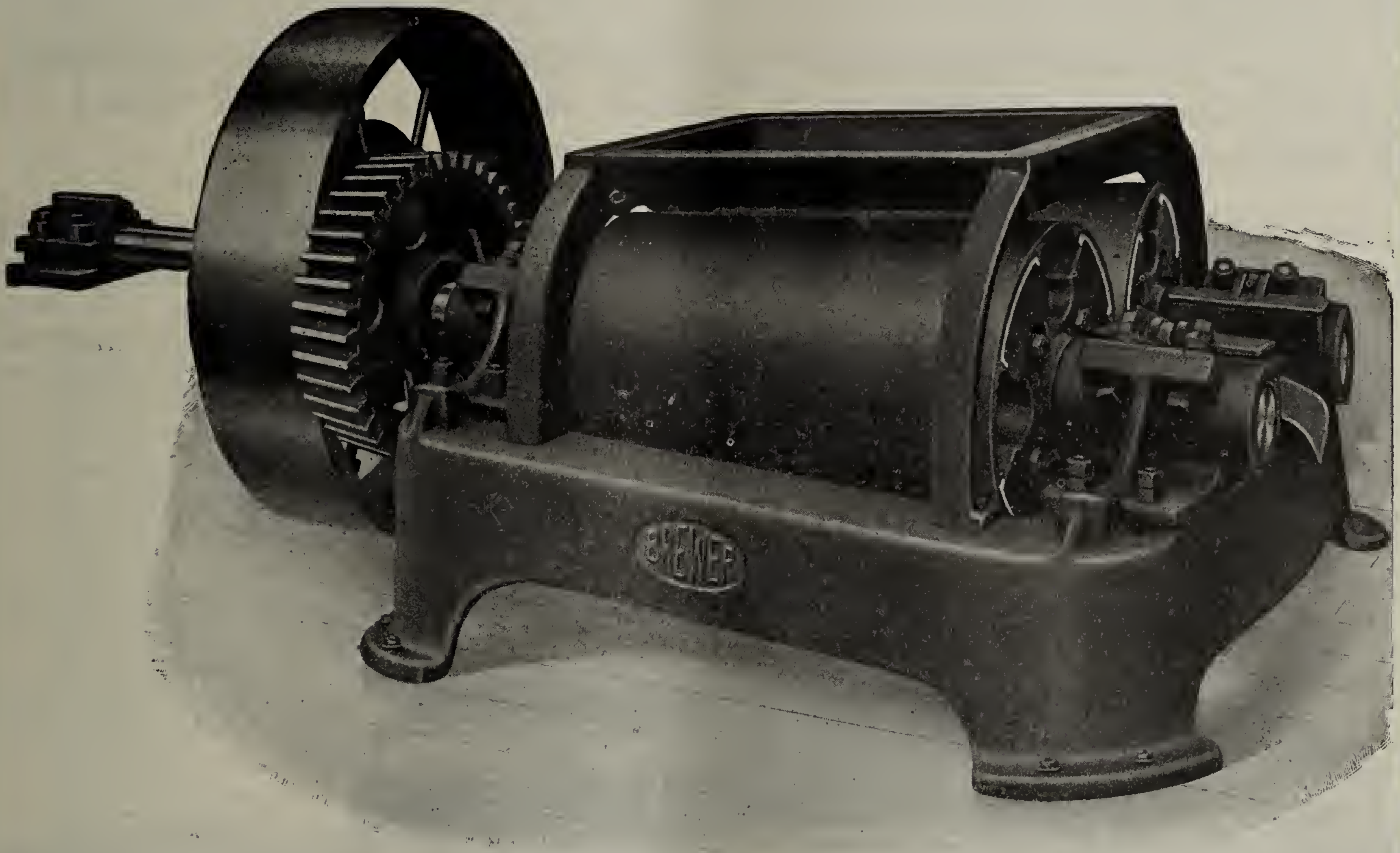
(Cross out the items not wanted, fill in and mail us the coupon.)

IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD · IF MARKED BREWER IT'S GOOD

CLAY CRUSHERS

We make a specialty of Crushers. We build all kinds and sizes—Conical, Straight, and Beaded Roll Crushers, Compound Crushers, Disintegrators and Dry Pans.

We make the rolls with removable shells and we make the shells of a special hard and durable material, which compared on a basis of cost, outwears manganese steel or anything else.



But Crushers are only a small part of our line—we also build

Brick Machines, Drain Tile Machines, Automatic Cutters, Pug Mills, Granulators, Hoists, Conveyors, Etc.

GET OUR COMPLETE CATALOG.

H. BREWER & CO. BREWER **Tecumseh, Mich.**

**HERE IS
A
KILN
THAT WILL
DO AWAY
WITH
YOUR
KILN LOSSES**

The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

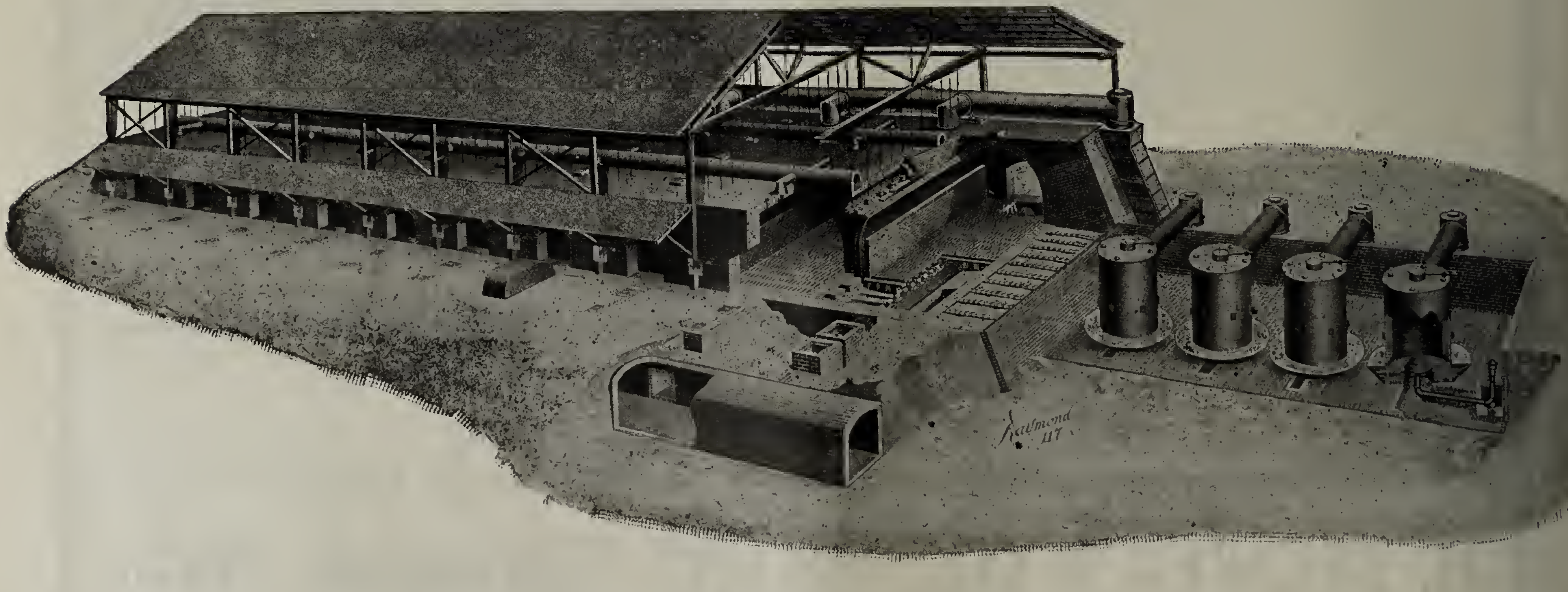
That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

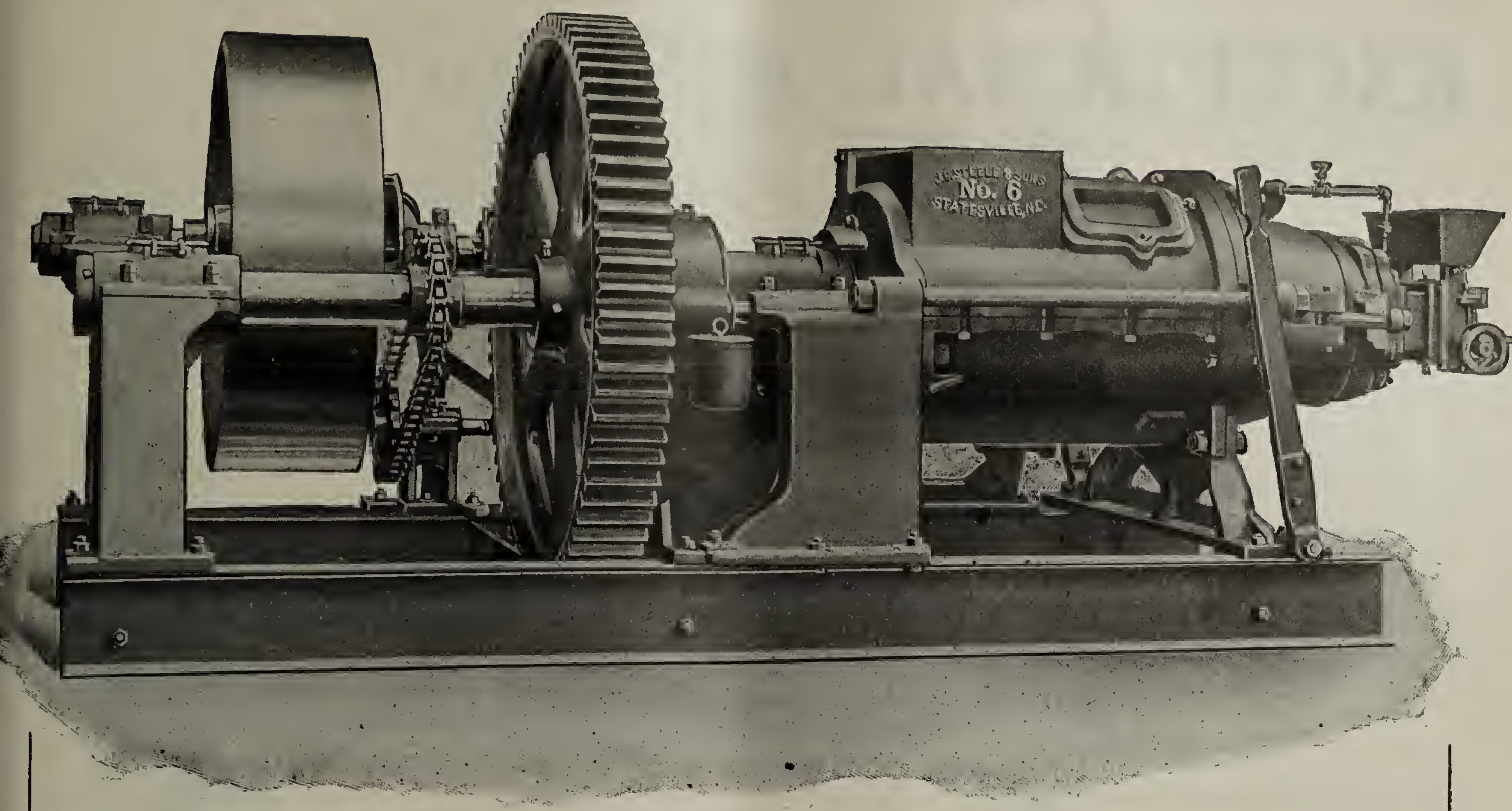
A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

International Clay Machinery Co.

Dayton, Ohio, U. S. A.



The Producer Gas Fired Continuous Kiln



(HOUSING REMOVED)

No. 6 Brick Machine, Capacity 50,000 to 150,000

A brick machine of largest capacity with single gear driving mechanism of new and improved design.

Tested for hours at a speed of 45 revolutions per minute of the auger shaft. Remember, engine speed and auger shaft speed are fixed speeds, and the less transmitting appliances between them, the less power required.

This machine has only two gears and four bearings—a reduction of three bearings, two gears and one shaft, as compared with most machines of large size.

The bearings are very large—from 4½ in. x 15 in. to 9 in. x 18 in.

The friction clutch pulley runs loose on a 7⅝ in. x 18 in. bearing.

The gear is very large, thereby reducing tooth load and side strain on bearings to a minimum; therefore reducing power required, wear and tear to a minimum.

Gears are cut, pinion being steel. Housed and run in oil bath.

Thrust bearing of most approved design, in front of gear; less than half frame. Outer end of auger shaft supported on out-board stand, thereby getting distance between bearings, and again reducing side strain and friction.

Sills are very heavy "I" beams with heavy channel for side strain.

Machine can be taken to pieces without elevating any part; will run equally well in either direction.

Cutter driving mechanism entirely separated from more important wearing parts, and get any speed in either direction.

Standard auger shaft for brick made of steel, 9½ in. in diameter, with inserted adjustable steel knives, and renewable wearing surface or shell. Also equipped with a system of continuous augers and bushings, telescoping mouthpiece, etc., for any kind of hollow ware. In this case, the shell is left off and knives fit over shaft.

A close examination will reveal many interesting points that we have not space to mention.

For further information address

J. C. STEELE & SONS

STATESVILLE, N. C.

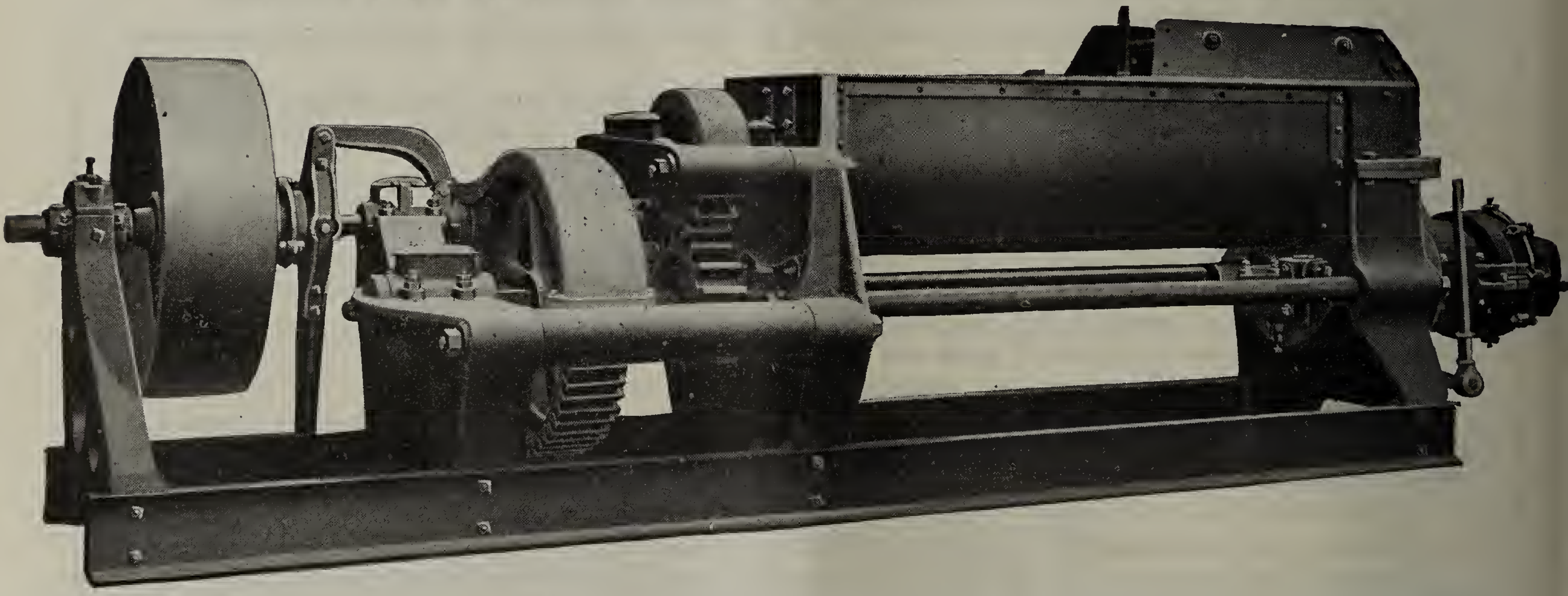
Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

EXCEPTIONAL PUGGING

For materials requiring a large amount of pugging, there is no more satisfactory equipment than a 12-foot pug mill over a Freese Union Machine.

This gives 20 to 24 feet of pug chamber, with no unusual distance between bearings, and requires no more structural work for building height than would be necessary for any brick machine with separate pug mill.

This extra pugging is of special advantage in the manufacture of paving block or fire brick.



Union Brick Machine

THE BRICK MACHINE WITH THE POSITIVE FORCE FEED

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For
Sixty-Three
Years
The Name

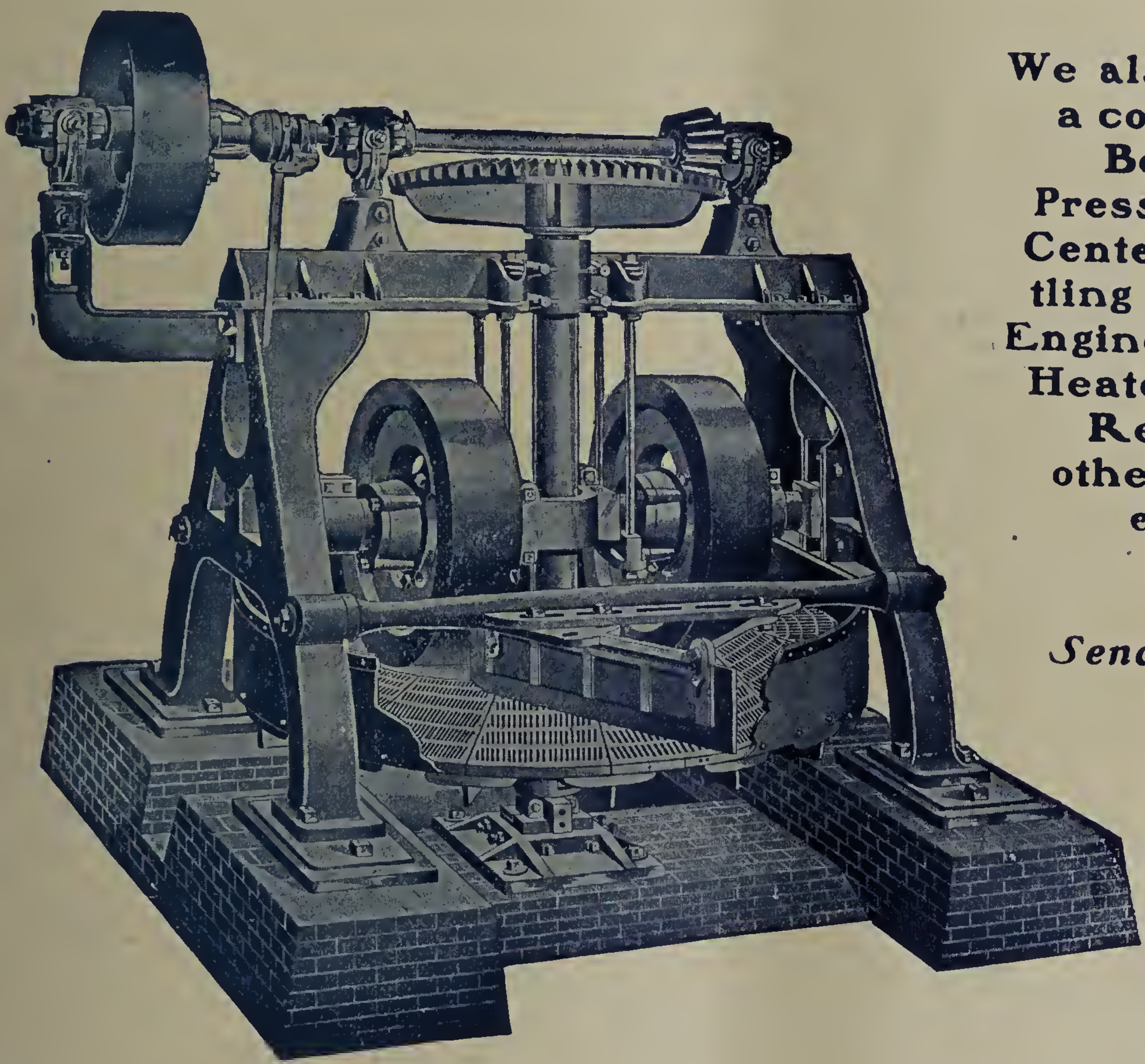
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.

The Wise Man of FATE

Kaufman Says:

"Plymouth Locomotives Cheaper than Horses for Hauling Clay"

M. J. Kaufman, purchasing agent for the Claycraft Brick Co., of Columbus and Groveport, Ohio, who bought a Plymouth Gasoline Industrial Locomotive, discarding horses, declaring that itwas cheaper to do that than to buy horses, and subsequent events have proven that his Plymouth is cheaper to operate and maintain.

"I Save 20c. per Thousand Brick"

Says Mr. Kaufman---

"We had three horses that cost us $225 each," writes Mr. Kaufman. "This, with the harness and equipment necessary, made The Plymouth cheaper in first-cost. It cost us 75c a day for feed, making a total of $2.25 per day. We employed three boys at $1 each, or $3 per day. This makes $5.25 per day for actual operation cost on the horses.

"We employ one man at $1.50 per day on The Plymouth. We used about seven gallons gasoline (67c) and quarter gallon lubricant (5c) making a total of $2.22 per day to operate The Plymouth, against $5.25 for the horses, and we get much more work out of The Plymouth.

"We gain also in mining for The Plymouth is hauling clay at 40c per thousand brick while the horses cost us 60c, a saving that more than paid for our Plymouth in a few months time."

This picture shows The Plymouth delivering a loaded train of cars to the mill from the shale bank, Claycraft Brick Co.

The Plymouth

Gasoline Industrial Locomotive Does These Things

It costs less to buy and install than any other system—whether horses, steam, electric, compressed air or other gasoline motor.
It costs less for fuel than any other system.
It costs less for operation than any other system.
It costs less for maintenance than any other system.
It has greater draw-bar pull than any other system.
It has greater traction power than any other system.

The Plymouth Will Do These Things for You

If The Plymouth will haul brick 20 cents per thousand cheaper for The Claycraft Brick Co., isn't it reasonable to suppose that it will haul your clay and your brick cheaper for you? It is worth while investigating, at least, is it not?

THIS BOOK TELLS THE FACTS

We have a big book of real facts and figures—just off the press. It is entitled "Cutting Haulage Costs in Two." It is full of cost data on this subject, collected from scores of clay plants, with much other valuable information, as well as numerous illustrations. Every clayworker ought to have a copy. You may have YOURS for the asking. Use coupon at left.

The J. D. Fate Company

242 Riggs Ave.
Plymouth, Ohio

Send us The Plymouth Book of Facts, this request not to obligate us.

(Firm) ....

(Your Name)..............

(City) ....

(Street) ....

(State) ....

The J. D. Fate Co.

242 Riggs Ave. PLYMOUTH, OHIO

This Cutter Delivers Hollow Ware Block On End Automatically

The Wise Man of FATE

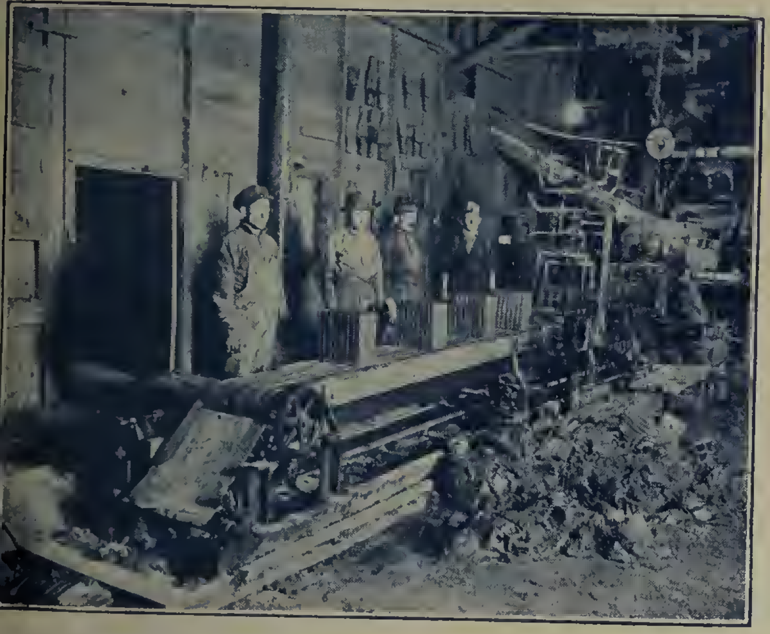
The New Fate "Type D" Cutter, with Automatic Delivery for hollowware, automatically cuts all hollow block up to 14x14 inches, delivers them on end, reduces labor cost, cuts down waste and makes a poor clay or a good clay a profitable clay.

The Fate Type "D" Cutter

Revolutionizes Block Making

It delivers the block on end so that it may be safely and quickly handled on an offbearing belt, which may be speeded up or slowed up at will with The Fate Friction Drive.

It eliminates the man who, usually, has to stand at the end of the cutter and acts as an offbearer.



Note the waste shown in the foreground above. This is a pile that was made before the Type "D" Cutter was put into operation.

The Troy Fireproofing Company Gives New Device Hard Test

One of the "Type D" machines has been in use in the plant of The Troy Fireproofing Co., Troy, N. Y. The clay here is of such a soft nature that, prior to the installation, it was difficult to produce ware with economy because of the waste at the delivery end of the cutter.

The "Type D" Cutter cut this waste down to a minimum and the Troy plant now is enabled to produce a perfect hollow block at good profit.

GET BOOK OF FACTS

Ve have a big book of facts. It contains information about the entire Fate line f clayworking machinery, and every clayworker ought to have a copy. Your opy will be sent you for the asking. Use the coupon at the right.

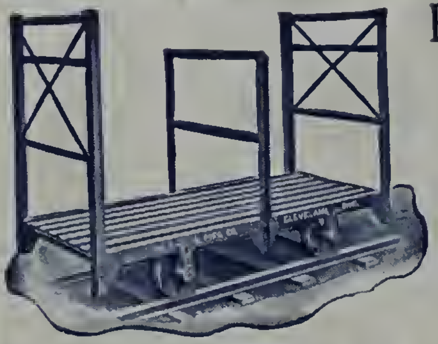
The J. D. Fate Co.

42 Riggs Ave. PLYMOUTH, OHIO

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

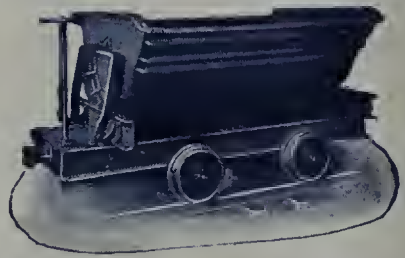
We are interested in the following machines or devices and ask that you send us special printed literature on the same, without obligation to us:

(List Items Here)..........
....
(Firm Name)..................
(Your Name)..................
(City) ....
(Street) ....
(State) ....



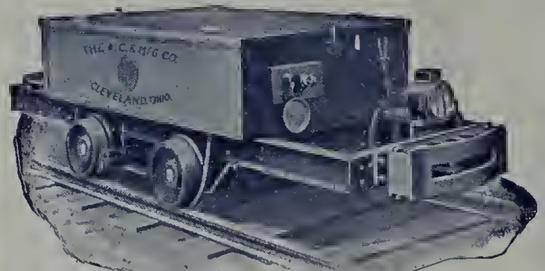
No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment



Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives



Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

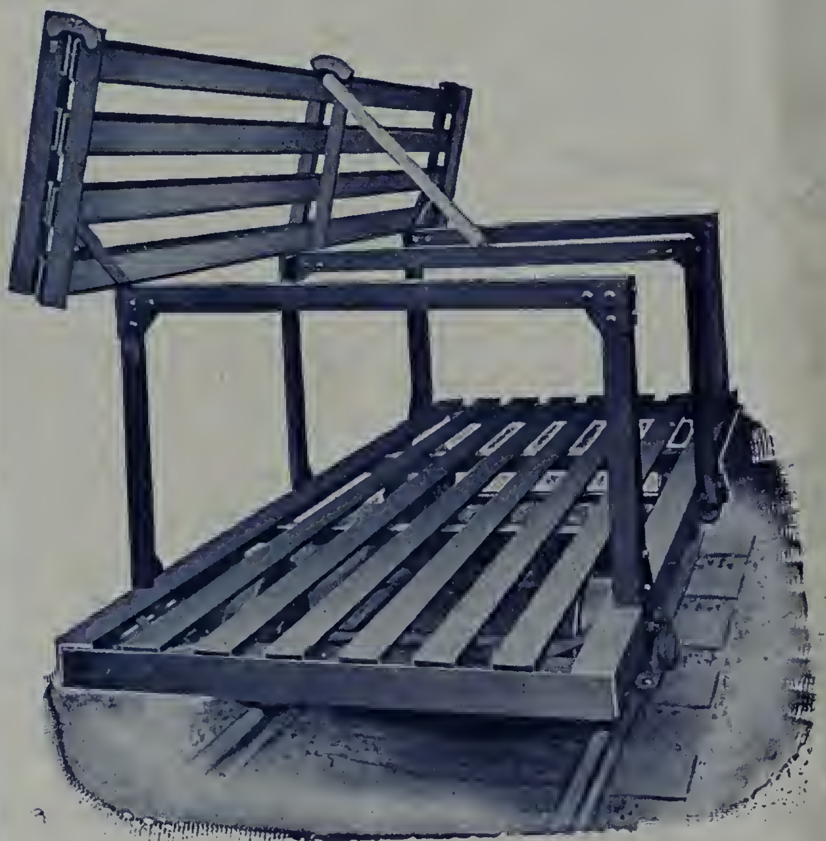
BAIRD

POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information

**Baird
Machine & Mfg. Co.**
54-56 Jefferson Ave.
Detroit, Mich.



With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

LAKEWOOD NO. 166

**Dryer Cars
Rack Cars
Dump Cars**

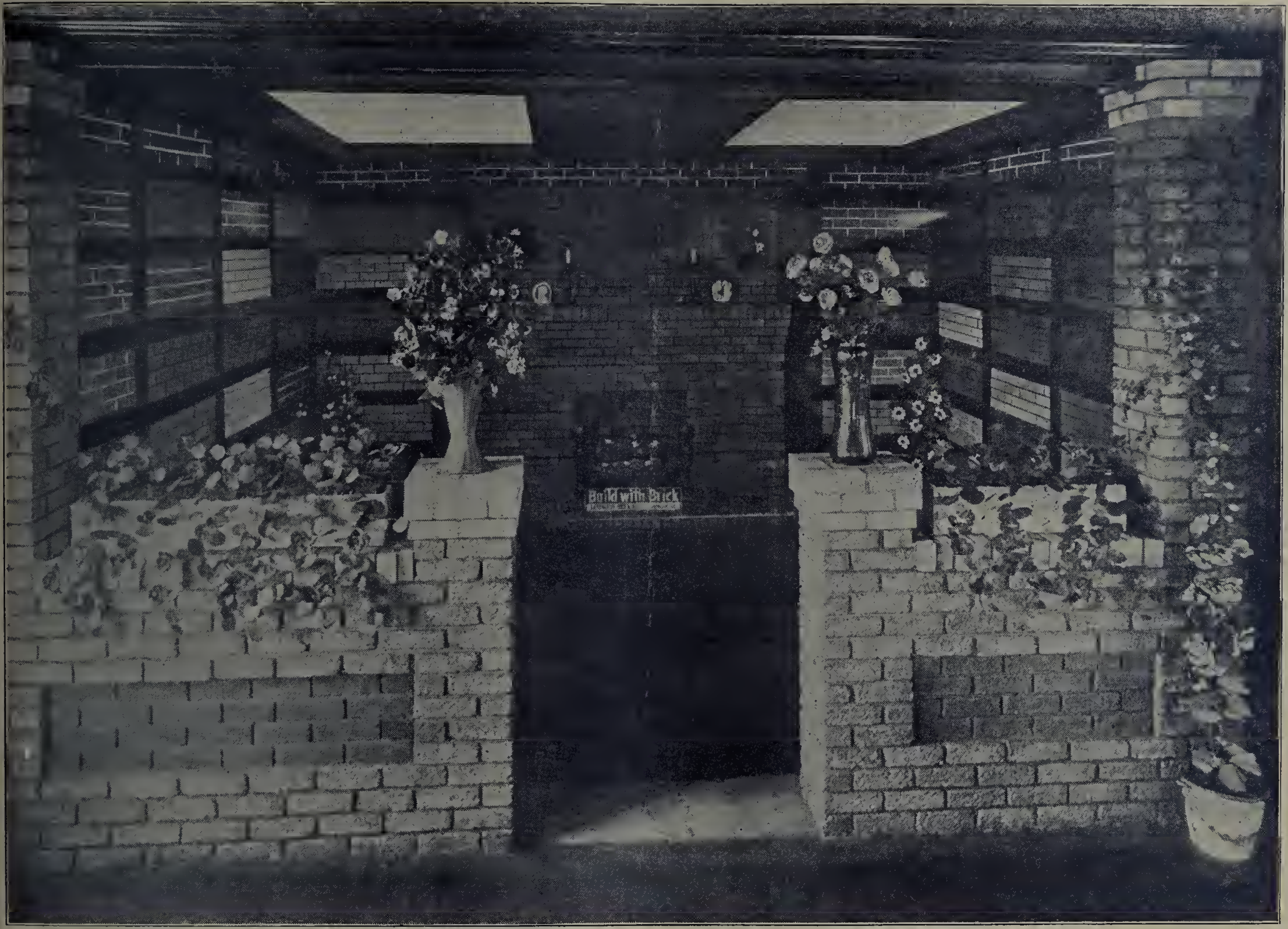
Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio
NEW YORK PHILADELPHIA PITTSBURGH
BALTIMORE CHICAGO

UNIVERSITY OF ILL

AUGUST, 1916

THE CLAY-WORKER



Fine Display of Front Brick in Office of Lexington Brick Co. See page 125.

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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BUYERS' READY REFERENCE LIST
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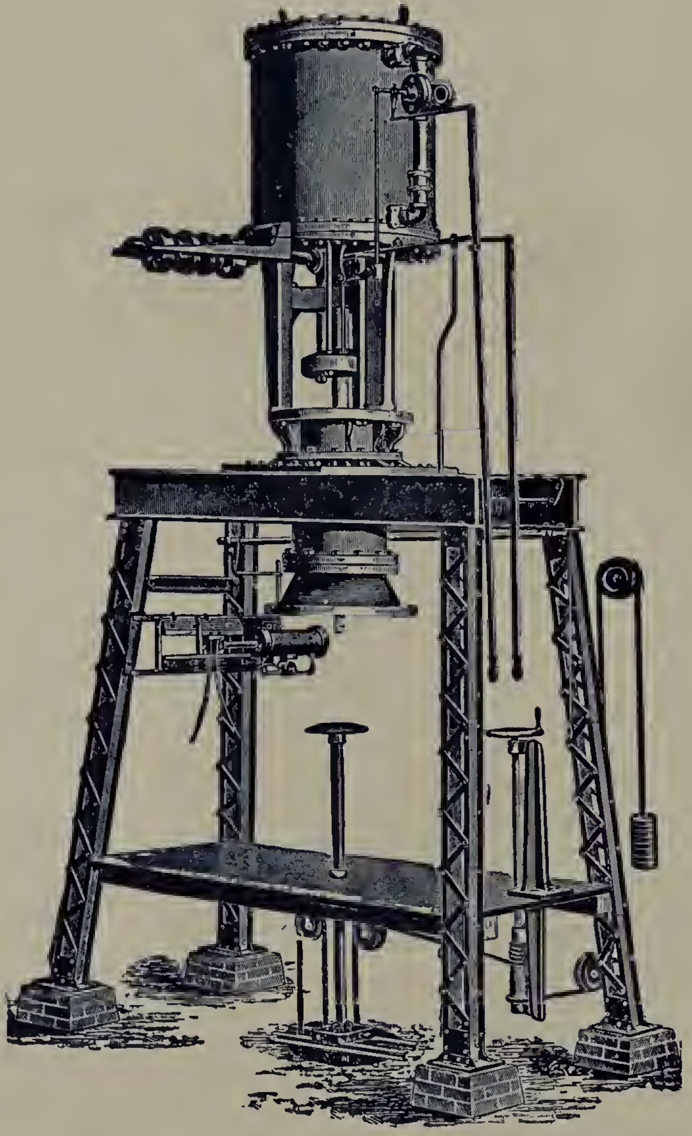
IT TAKES THE BEST TO MAKE THE BEST.

You cannot get a piece of steel out of a piece of lead.



PARTIAL LIST OF REFERENCES BELOW:

W. S. Dickey Clay Mfg. Co.	Kansas City, Mo.
Wm. E. Dee Clay Mfg. Co.	Chicago, Ill.
Denver Sewer Pipe Co.	Denver, Colo.
Denny-Renton Clay & Coal Co.	Seattle, Wash.
Los Angeles Pressed Brick Co.	Los Angeles, Cal.
Independent Sewer Pipe Co.	Los Angeles, Cal.
Robinson Clay Product Co.	Akron, O.
Robinson-Graves Co.	Uhrichsville, O.
Pomona Terra Cotta Co.	Pomona, N. C.

and above 150 other of the largest clayworking concerns in important commercial centers of the United States.

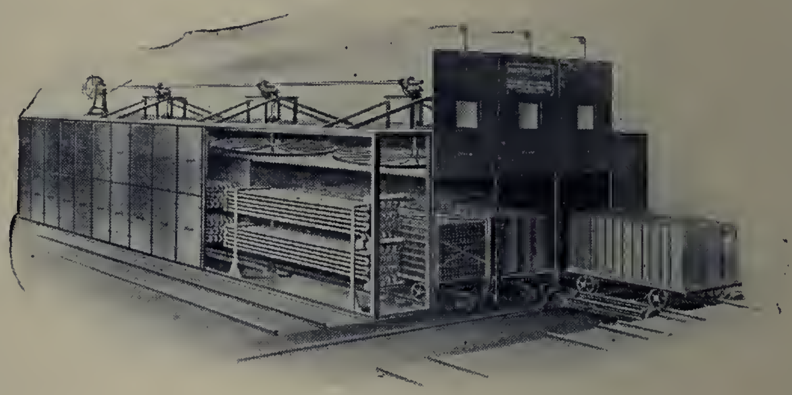
The Taplin, Rice-Clerkin Co.

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.

"Proctor" DRYERS

We respectfully invite you to investigate the merits of

THE



"PROCTOR" DRYER for CLAY PRODUCTS

↓

To help you in your investigation we make the following statements of fact—not claims—

⁂

One brick plant now uses only 60 dryer cars whereas formerly they used 730, a saving of 670 cars and the space they took up.

⁂

In another plant the "PROCTOR" is safely drying nine duct conduit in 6 hours —former time 48 hours.

⁂

4-in. drain tile in 60 minutes.

⁂

Standard plastic fire clay brick in 12 hours —former time 48 hours.

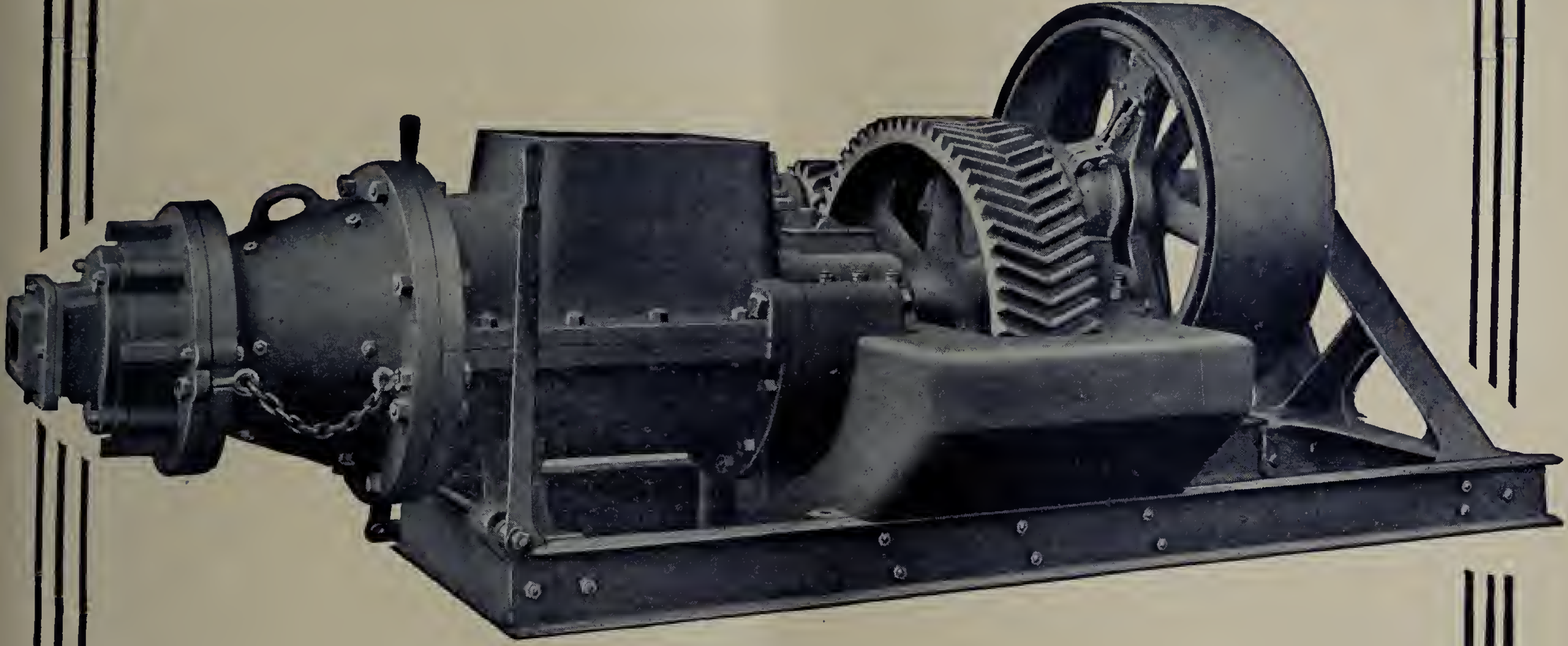
⁂

You owe it to yourself to investigate this wonderful dryer that cuts down the cost and difficulty of drying.

⁂

Start your investigation now—write us.

The Philadelphia Textile Machinery Co.
Philadelphia, Pa.



THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.

THE BONNOT COMPANY
CANTON, OHIO

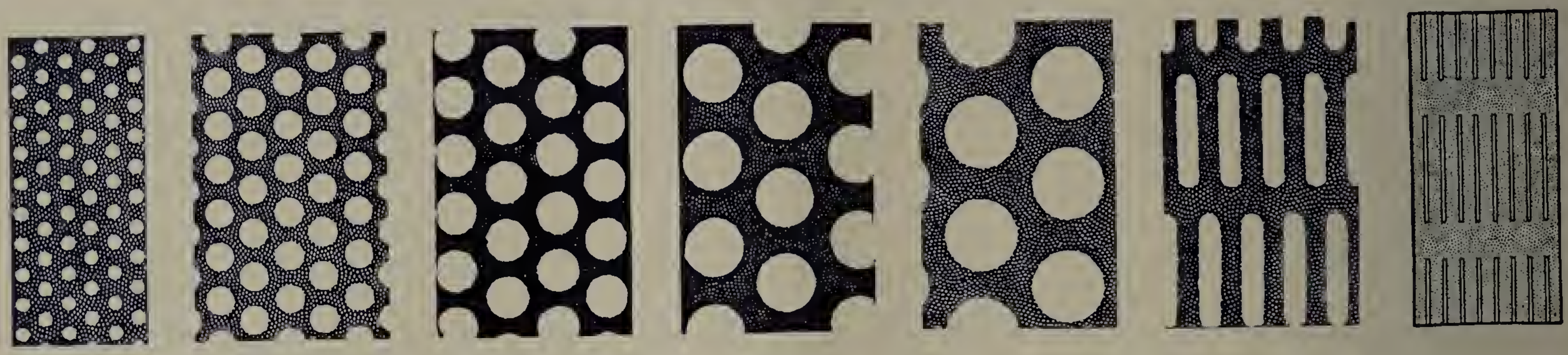
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

"No Wheelers Wanted" at this Plant for Loading Cars.

The rush season has no terrors for the Cuyahoga Brick & Shale Co. (Cleveland, Ohio.) The photograph at the left shows how they have beaten the "wheeling" game with a system of Mathews Gravity Brick Conveyers. A steady stream of brick flows steadily from kilns into cars in any kind of weather and with any kind of help.

This method enables you to roll your brick by gravity on a slight down grade, with no waste of time or labor to pay for, no damaged brick to discard, no expensive pay roll to take care of, and no fear of not being able to get your brick loaded promptly at all times.

Many large brick manufacturers have become users of the Mathews system this year. Hundreds of others have employed the gravity method for many years and could not be induced to discard it for any other method. We can supply prospective purchasers with plenty of references if desired.

Made entirely of steel, equipped with ball bearing rollers, assembled in portable units fitted with universal couplings. Curves of any desired angle can be supplied to deliver the brick to any required destination. Will last for years with very little upkeep expense.

Our representative will visit your plant, lay out a system to fit your requirements, tell you what it will cost, and take your order, all without extra cost. This service will not obligate you to buy if our proposition does not prove attractive. We can send you literature, but valuable time will be saved by requesting representative to call.

MATHEWS GRAVITY CARRIER CO.

Branch Factories:
TORONTO, ONT.
LONDON, ENG.

ELLWOOD CITY, PA.

FROM ZANESVILLE, OHIO

May 25, 1916.

To Whom It May Concern:

As pioneers in the clay industry, having been engaged in the manufacture of Paving Brick, as well as other Clay Products, since 1868, we have had experience with practically all types and makes of Machinery and Dryers.

When we decided, about a year ago, to rebuild our plants and make them uptodate in every respect, our main object was to obtain economical results, along conservative lines, in every department.

Before beginning our rebuilding, we made extensive investigations throughout the country. As a result we found that Mr. L. E. Rodgers, of the L. E. Rodgers Engineering Co., was doing the greater portion of the engineering work for the largest and most successful manufacturers. We retained Mr. Rodgers and installed his Waste Heat System of Drying in our plants. We made no mistake in so doing. We now have in our plants the most modern and successful dryers possible to build and are getting results far in excess of our expectations.

Our brick are coming out of the Dryers absolutely dry, at the minimum cost. The time of burning has been considerably reduced, owing to the fact that the brick are dry when set and the quality of our product has been raised to the highest standard.

Every guarantee made us was more than realized, and we were pleased to know Mr. Rodgers underestimated the value of his system. Our plants have always been open to the Brickmaking fraternity, and anyone is welcome to inspect our System.

We also wish to state that neither Mr. Rodgers nor any of his organization are financially or otherwise interested with us and that this letter is our voluntary testimonial of the merit of the Rodgers Dryer.

We cannot speak too highly of Mr. Rodgers, his Dryer and his business-like method of caring for his clientele.

Very truly yours,
THE BURTON-TOWNSEND CO.
(Signed) By R. C. Burton, President.

L. E. RODGERS ENGINEERING CO.

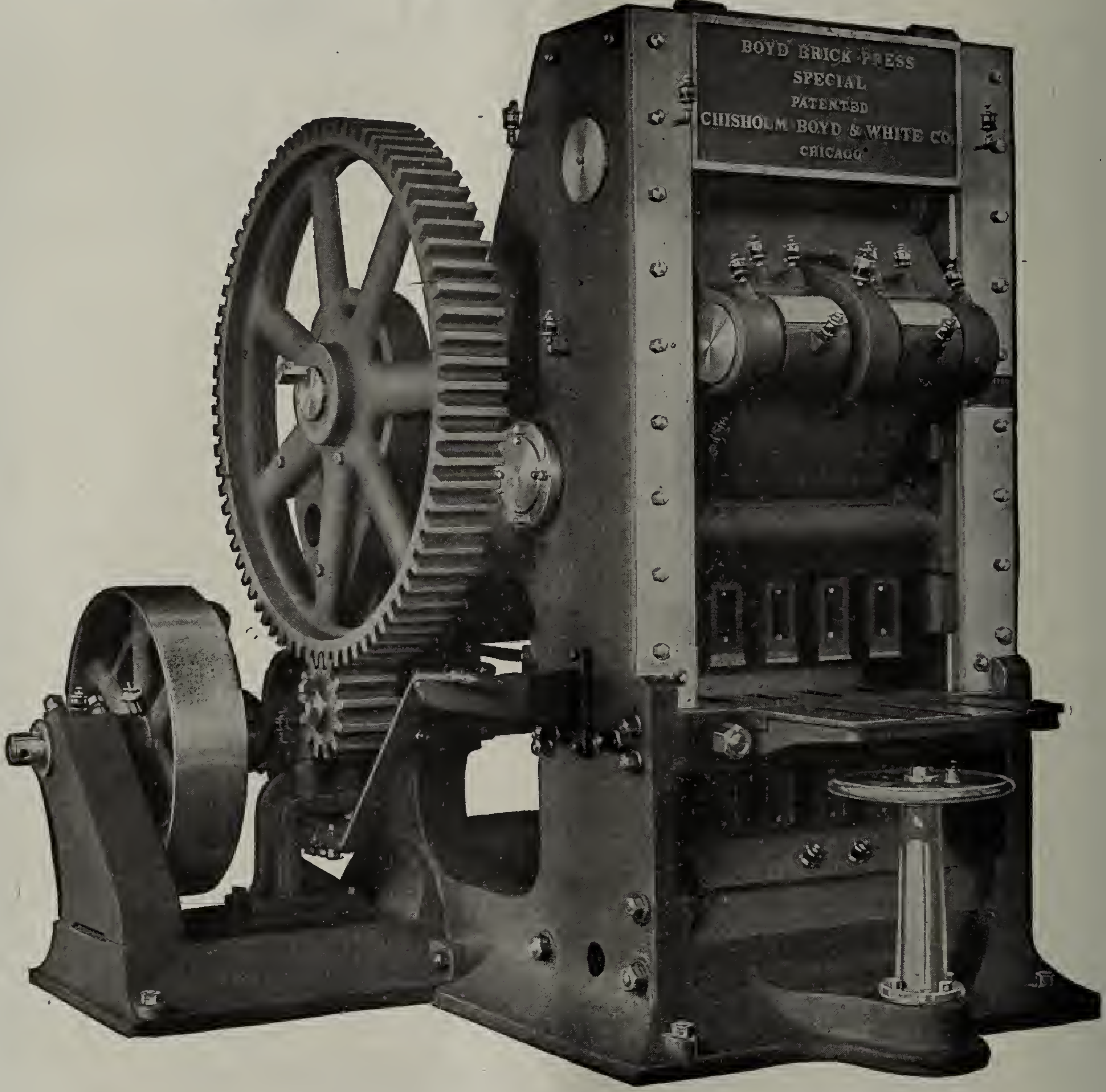
Waste Heat Dryer Specialists
Brick Works Engineers

Largest Manufacturers of Brick Drying Equipment in the United States

General Offices ZANESVILLE, OHIO

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

Buyers Ready Reference List.

To Find Any Particular Firm or Advertisement See "Index to Ads" as Cited on Front Cover Page.

Ammeters.

The Brown Instrument Co.
Beighlee Electric Co., The.

Analysists and Chemists.

Ceramic Supply & Con. Co.
N. J. State University.

Arch Cutting Apparatus.

Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.

Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.

(See Cutting Tables.)

Barrows and Trucks.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
H. Brewer & Co.
Carnell, Geo.
Chambers Bros. Co.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.

Roessler-Hasslacher Chem. Co.

Bearings, Roller.

(See Supplies.)

Belting.

Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Blowers.

American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.

American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.

Brick (Building).

Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).

Parker-Russell M. & M. Co.

Brick (Paving).

Alton Brick Co.
Aspha-Bric Corporation.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Mchy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Fernholtz Brick Machy. Co.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Soft Mud).

American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Martin Brick Mch. Mfg. Co., H.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Brick Machines (Dry Press).

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.

International Clay Mach. Co.

Brick Setting Machinery.

American Clay Machinery Co.

Buffing Machinery.

American Clay Machinery Co.

Burning and Drying Systems.

American Clay Machinery Co.
American Blower Co.
Boss, John C.
F. W. Dennis.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.

(See Dryer and Dumping Cars.)

Carbide Coating.

Stowell, E. R.

Castings.

American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.

Brick & Clay Engineering Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Clay Crushers and Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Phillips & McLaren Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clays.

American Clay Machinery Co.

Clay Dryers.

American Process Co.
Schaffer Eng. & Equip. Co.

Clay Feeders and Mixers.

American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.

(See Scrapers.)

Clay Steamers.

American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.

American Clay Machinery Co.
Fate Co., The J. D.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.

(See Supplies.)

Coloring Materials.

Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.

Orton, Edward, Jr.

Consultnig Engineers.

Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.

American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.

Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Couplings.

(See Supplies.)

Cutting Tables (Brick & Tile).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.

American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.

(See Supplies.)

Dies.

Louisville Machine Co., The.
(See Supplies.)

Disintegrators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.

Ceramic Supply & Con. Co.

Drain Tile Machinery.

(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.

(See Supplies.)

Dryers.

American Clay Machinery Co.
American Process Co.
Brick & Clay Engineering Co.
Boss Co., John C.
Chambers Bros. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
National Dry Kiln Co.
Philadelphia Textile Mach. Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

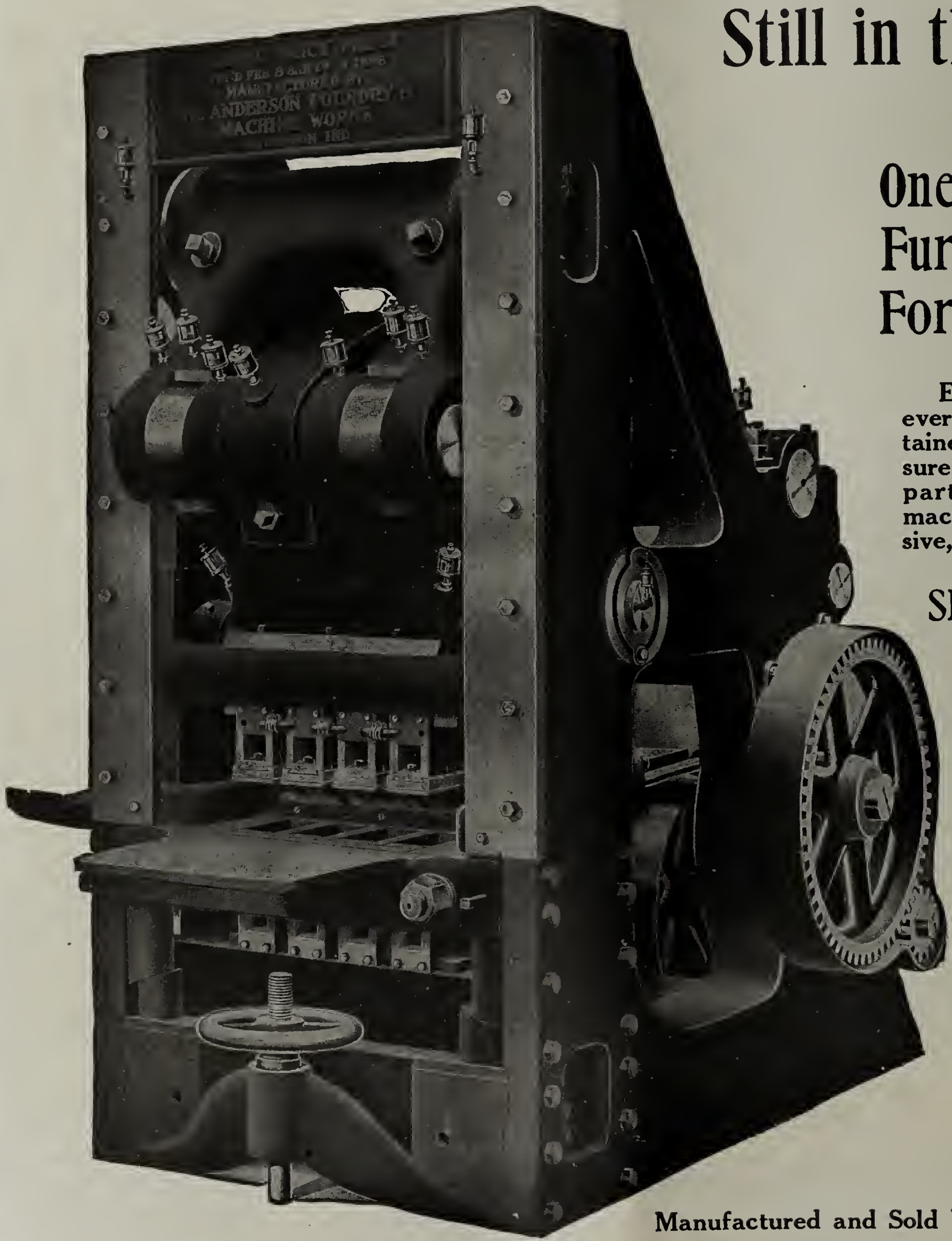
Dryer Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
National Dry Kiln Co.

(Continued on page 113.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple. massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

ANDERSON, IND.

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Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.
Wilson, Thomas M.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Louisville Machine Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Beighlee Electric Co., The.
Brown Instrument Co., The
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
Beighlee Electric Co., The.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

Elevating Equipment.

(See Conveyors.)

Engines.

American Clay Machinery Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co
Lovejoy, Ellis.
Rodgers Engr. Co., The L. E.
Schaffer Eng. & Equip. Co.
Trautwein Dryer & Engr. Co.

Fans.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

Filter Presses.

American Clay Machinery Co.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Fire Brick and Fire Clay.

Parker-Russell M. & M. Co.

Floor Tile.

Chicago Ret. & Fire Brick Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

Brick & Clay Engineering Co.
Brown Instrument Co., The
International Clay Mach. Co.

Gas Fire Continuous Kilns.

Raymond Co., The C. W.

Gears.

(See Supplies.)

Granulators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Grates.

American Clay Machinery Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.

Gravity Carriers.

Mathews Gravity Carrier Co.
Taplin-Rice-Cerkin Co.

Gravity Haulage.

American Clay Machinery Co.

Grouter.

Marsh-Capron Mfg. Co.

Hand-Power Presses.

American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Stevenson & Co.

Hand Winch.

(See Supplies.)

Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Illustrators.

Lamb, J. & R.

Insurance.

Mantel, Tile and Grate Monthly.

Jacks.

(See Supplies.)

(Continued on page 115.)

MUELLER'S NEW AUGER BRICK MACHINERY

Auger Brick Machines of most advanced design, in capacity from 8,000 to 60,000 per day.

Horsepower Brick Machines, Hand Plunger Presses for drain tiles, hollow blocks, etc.

Smooth Roll Crushers, with two and three rolls, Break-roll Crushers for hard shale.

Pug Mills, single or double shaft, for any capacity, Automatic Feeders.

Automatic Brick, Block and Drain Tile Cutters.

Hand tables for all kinds of clay products, designers of special tables.

Complete equipment for making lockplate building blocks, coupling building blocks and other hollow wares.

ROOFING TILE MACHINERY

Revolving Presses, Trimming Presses, Hand Roofing-Tile Presses, molds in plaster or metal.
Special Double Shaft Auger Machines for roofing tiles, and mechanically lubricated dies.
Cutting tables for shingles, promenades, interlocking, Spanish tiles etc.

MUELLER BROS.

1436 MacKlind Ave. (on Frisco Tracks) ST. LOUIS, MO.

Trautwein
DRYERS

What Trautwein Service Means---

As manufacturers of Dryers and Dryer Equipment we are prepared to study the conditions at your plant—to make a commercial test of your clay to determine what method of drying will best suit your needs—

We have no single set design or ideas to force upon you.

Also—as Engineers we have gained an enviable reputation as Complete Plant Builders, and we can point with pride to our achievements.

Yet—we are also just as proud of the fact that our recommendations have kept many misguided enthusiasts from disastrous ventures when we showed them that they did not have a proposition that could be made a commercial success.

If That's the Kind of Service YOU Want---

Write us—tell us of any conditions in your plant that may be bothering you—or of any plans you have in mind. There will be no obligation—rather will it be a pleasure to study your problems.

Trautwein Dryer & Engineering Co.

Manufacturers of Drying Equipment
ENGINEERS---
417 South Dearborn St. CHICAGO, U. S. A.

Do Any of Your Kilns Look Like This?

There's One Safe Way

to prevent this condition—one sure way to save that big item of "kiln repairs" that you have been charging up each year—adopt

The Smith Steel Encased Kiln

We have facts and figures to prove what savings we have made for others—why not let us send them to you?

CLAUDE SMITH CO.
KILN BUILDERS
Plymouth Bldg., Chicago, U. S. A.

Buyers Ready Reference List—Continued.

Kilns.
American Clay Machinery Co.
Boss Co., John C.
Brick & Clay Engineering Co.
F. W. Dennis.
Hook Patent Kiln Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Ohio Kiln Co., The.
Richardson, W. D.
Smith Co., Claude.
Swift, Edward A.
Yates, Alfred

Kilns, Doors, Castings and Frames
(See Supplies.)

Kiln Bands.
Holliday, W. J., & Co.

Kiln Floor Tile.
Chicago Ret. & Fire Brick Co.

Knives.
(See Supplies.)

Locomotives.
Davenport Locomotive Works.
Dewey Bros.
Fate Co., The J. D.

Manganese.
(See Coloring Materials.)

Mechanical Draft.
American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

Mineral Paint.
(See Coloring Materials.)

Molds (Brick).
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Wallace Mfg. Co.

Mortar Colors.
(See Coloring Materials.)

Motor Trucks.
Fate Co., The J. D.

Oil Burners.
Schurs Oil Burner Co.

Paints.
(See Coloring Materials.)

Pallets.
Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).
(See Dry and Wet Pans.)

Paving Brick or Block.
(See Brick.)

Perforated Sheet Metal.
Caldwell & Sons, H. W.
Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

Pitch (Paving).
Barrett Mfg. Co.

Plows.
(See Scrapers.)

Poidometers.
Schaffer Eng. & Equip. Co.

Portable Track.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.

Pottery Machinery.
American Clay Machinery Co.
Baird Machinery & Mfg. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

Powder.
Dupont, E. I. & DeNemours Co.

Power Plant Equipment.
American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Presses.
(See Brick Machines, also Sewer Pipe Machinery, also Roofing Tile Machinery.)

Pug Mills.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Pulleys.
(See Supplies.)

Pulverizers.
American Clay Machinery Co.
American Pulverizer Co.
Fate Co., The J. D.
Taplin-Rice-Clerkin Co.

Pumps.
Ceramic Supply & Con. Co.
Dean Bros. Steam Pump Wks.
Potts & Co., C. & A.

Pyrometers.
Beighlee Electric Co., The.
Brown Instrument Co.
Ceramic Supply & Con. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co., The

Rails and Railway Equipment.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Ceramic Supply & Con. Co.
Davenport Locomotive Works.
Fate Co., The J. D.
Lakewood Engineering Co.

Rattlers (Paving Brick).
American Clay Machinery Co.
Ceramic Supply & Con. Co.
Freese & Co., E. M.
Hetherington & Berner.
Phillips & McLaren Co.

Recording Gauges.
Brown Instrument Co.
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Represses.
American Clay Machinery Co.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Revolution Indicators.
Brown Instrument Co.
Ceramic Supply & Con. Co.

Revolving Steam Shovels.
American Clay Machinery Co.
Thew Automatic Shovel Co.

(Continued on page 116.)

THE ELWOOD BRICK PRESS
MADE BY
THE CHICAGO BRICK MACHINERY CO.
NO. 801. CHICAGO, ILL. PAT. PEND.

ELWOOD PRESS

BUILT FOR HEAVY DUTY.
ALWAYS MAKES GOOD.

WE ALSO HANDLE EVERYTHING USED ON A BRICKYARD.

CHICAGO BRICK MACHINERY CO.
20 W. Jackson Blvd., Chicago

Sold Also by
MANUFACTURERS EQUIPMENT CO.
Dayton, Ohio.

Buyers Ready Reference List—Continued.

Rock Crushers.

American Clay Machinery Co.
American Pulverizer Co.
Phillips & McLaren Co.

Roofing Tile Machinery.

American Clay Machinery Co.
Fate Co., The J. D.
International Clay Mach. Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Rope.

(See Supplies.)

Rotary Dryers.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Fate Co., The J. D.
Hensley, J. W.
International Clay Mach. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.

Sand Dryer and Sand Sieves.

American Clay Machinery Co.
Ceramic Supply & Con. Co.

Sand Lime Brick Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Fernholtz Brick Machinery Co.
International Clay Mach. Co.
Lakewood Engineering Co.

School of Ceramics.

Illinois University.
Iowa State College.
New Jersey State School.
New York State School.
Ohio State University.

Scrapers, Plows and Clay Gatherers.

Arbuckle & Co.
Lechtenberg Brothers.
Eagle Iron Works.

Screens.

American Clay Machinery Co.
Brewer & Co., H.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Harrington & King Perf. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Taplin-Rice-Clerkin Co.

Sewer Pipe Machinery.

American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Taplin-Rice-Clerkin Co.

Steam Gauges.

(See Supplies.)

Steam Shovels.

American Clay Machinery Co.
Thew Automatic Shovel Co.

Steam Specialties.

American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Steam Traps.

American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Steel Pallets.

Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Atlas Car & Mfg. Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
Hensley, J. W.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Switches.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Lakewood Engineering Co.

Tempering Wheels.

Carnell, Geo.
International Clay Mach. Co.

Thermometers.

Brown Instrument Co.
Ceramic Supply & Engr. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co.

Tile Machines.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., H.
Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
Hensley, J. W.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Time Recorders.

Beighlee Electric Co., The.
Brown Instrument Co.
Ceramic Supply & Engr. Co.
Thwing Instrument Co.

Tracks and Switches.

(See Rails.)

Transfer Cars and Turn Tables.

(See Supplies.)

Turn Tables.

American Clay Machinery Co.
Fate Co., The J. D.

Unloading Device for Pans.

American Clay Machinery Co.
Frost Mfg. Co.
International Clay Mach. Co.

Voltmeters.

Brown Instrument Co.

Wheels and Axles.

(See Supplies.)

Wheelbarrows.

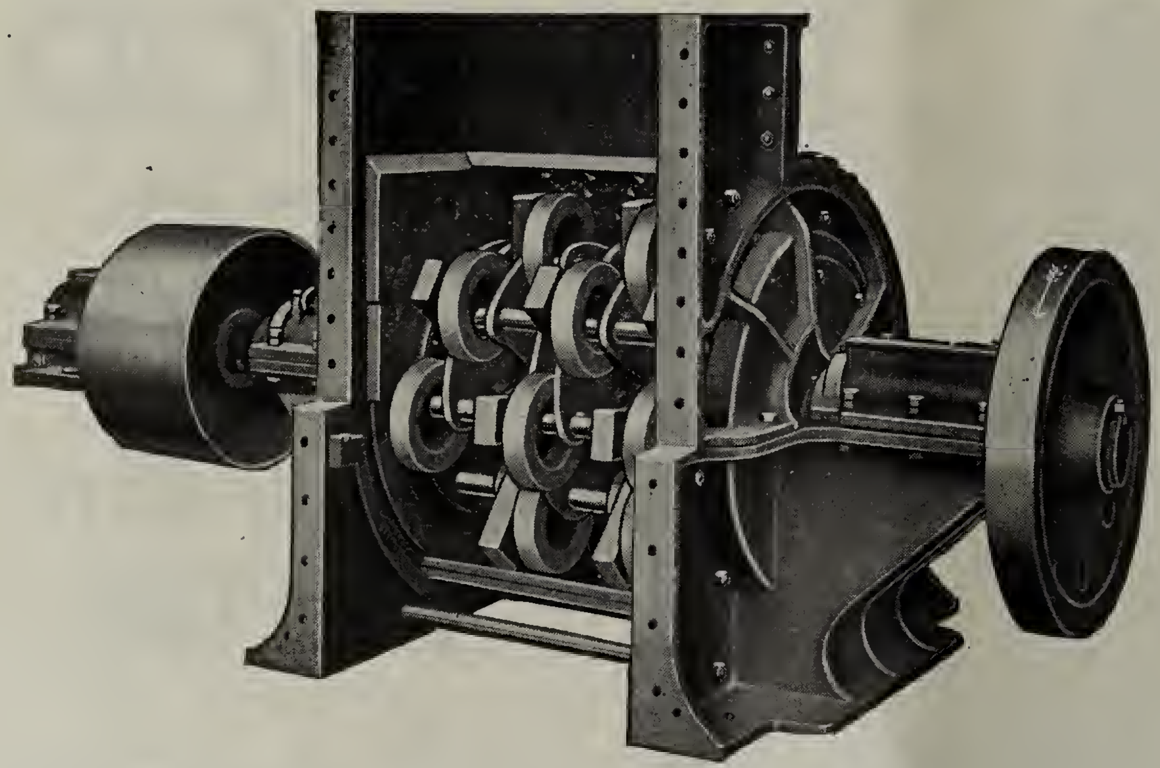
(See Barrows.)

Wet Pans.

(See Pans.)

Wire.

(See Cutting Wire.)



The **MACHINE**
that has
POWER to PRODUCE

and will pulverize Shale or Shale and Clay, Brickbats, Coal, Coke, Marl, Kaolin, Sandstone, Burnt Lime, Fire Clay, etc.

Are You in Need of a MACHINE

that can pulverize **18 to 25 Tons of Shale and Clay per hour** and save 50 per cent installation cost.

Describe your material, ask for catalog, and information.

GEO. C. VIDETTO
Eastern Sales Manager
207 Fulton Building, Pittsburg, Pa.

American Pulverizer Co.
EAST ST. LOUIS, ILLINOIS

LET MENTZ

YOUR FUTURE

LET MENTZ MOULD YOUR FUTURE

LET MENTZ MOULD YOUR FUTURE

MENTZ MOULDS WILL MOULD YOUR FUTURE SO YOU WILL SAVE MONEY, MAKE A BETTER PRODUCT AND LARGER PROFITS.

MR. George B. Mentz has made a lifetime study of the manufacture and use of brick moulds on his plant near the Hudson River. His close contact with the manufacturers of soft mud brick and the brick business in the East affords him every opportunity of knowing what is required and what is absolutely right. His moulds meet every requirement, and today are far superior to any other moulds made in this country.

The general use of Mentz Moulds in the great Hudson River and New Jersey brickmaking districts and throughout the East and in Canada, shows their real value. These moulds are also found in the leading soft mud plants in the Middle West. It is a fact that can be proven that no brickmaker who has given the Mentz Moulds a fair trial would do without them.

Write for Information.

The G. B. MENTZ CO.

WALLKILL, N. Y.

"Aspha=Bric"

A high grade type of paving brick, produced at a nominal cost, from your common builders.

Aspha-Bric can be produced by you. Send samples of your materials to Chicago address for complete test.

Write for particulars.

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608 Hibernia Bk. Bldg.

BOSTON
714 Tremont Bldg.
BUFFALO
820 Marine Nat. Bk. Bldg.
MINNEAPOLIS
729 Andrus Bldg.
TAMPA
6 Jackson Block
KANSAS CITY
212 Dwight Bldg.

CHICAGO
540 Otis Bldg.
TOLEDO
626 Ohio Bldg.
DENVER
401 Tramway Bldg.
BIRMINGHAM
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BOOST

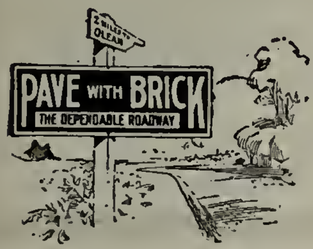
BUILD WITH BRICK

BOOST

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.



IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

(Cross out the items not wanted, fill in and mail us the coupon.)

"PAVE WITH BRICK" SIGNS FREE

Be a Booster for Brick Streets and Highways.
Send for signs to tack up where dependable pavements are needed.

National Paving Brick Manufacturers Association
Will P. Blair, Secretary, Engineers' Bldg. CLEVELAND, OHIO

SHAWMUT VITRIFIED PAVING BRICK WORKS

Shawmut, Pa. Alfred Yates, Gen. Mgr.

Vitrified Shale and Fire Clay Paving Brick and Blocks.
Burned in Yates' Patent Kiln.
Samples and prices on application.

ALTON BRICK COMPANY

Makers of High Quality Brick for
Roadways and Permanent Buildings.
Repressed and Wire-Cut-Lug Block.
ALTON, ILLINOIS

PAVING BUILDING • BRICK AND BLOCK • SIDEWALK FOUNDATION

The Barr Clay Co.

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The Danville Brick Company
Manufacturers of the Unsurpassed

Danville Paving Block

Danville, Ill.
LET US QUOTE YOU PRICES.

OXBLOOD RED FRONT BRICKS
DEVONSHIRES and REPRESSED

KUSHEQUA

Highly Vitrified by Natural Gas.
Tough Paving Blocks, Beautiful in Color and Finish.
KUSHEQUA BRICK CO., Kushequa, Pa.

McAVOY VITRIFIED BRICK COMPANY

PHILADELPHIA, PA.
"McAVOY BLOCK"

PROMENADE TILE

Chocolate Red
Highest Vitrification—Lowest Absorption.
BEST BY TEST.
KUSHEQUA KERAMIC COMPANY,
Kushequa, Pa.

Bessemer Limestone Company

Youngstown, Ohio
Manufacturers of Bessemer Block
The Most Uniform Shale Paver Made.

Tile Underdrainage.

By J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distribution among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

PAVE WITH BRICK

THE DEPENDABLE ROADWAY

MEDAL

The block with experience and service behind it. For 29 years the product of the present company has given satisfaction. We are the oldest paving brick manufacturers in Ohio west of the Ohio River.

MEDAL REPRESSED WIRE-CUT-LUG and HILLSIDE BLOCK.

The Medal Paving Brick Co.
Formerly The Deckman-Duty Brick Co.
1305-6-7-8 Sweetland Bldg., Cleveland, O.

"Best Paving Block Made"

Daily Capacity
500,000

The Metropolitan Paving Brick Co.
Canton, Ohio

SERVICE FIRST!

IRONSTONE BLOCK

OFTEN RATTLED BUT NEVER EMBARRASSED

A BLOCK OF THE IRONSTONE QUALITY IS ECONOMY

REPRESSED OR DUNN WIRE-CUT-LUG

Terre Haute Vitrified Brick Co.
TERRE HAUTE, IND.

Murphysboro Paving Brick Company

Manufacturers of

The Celebrated

EGYPTIAN PAVING BLOCK

The Block That Stands the Test.

Prices and samples furnished
upon application.

MURPHYSBORO, ILL.

VITRIFIED PAVING BRICK

A valuable treatise on the manufacture and use of Paving Brick up to date. By H. A. Wheeler, E. M. Second edition.

Mailed to any address on
receipt of $2.00.

T. A. Randall & Co. (Inc.) Publishers
Indianapolis

CLINTON PAVING BRICK CO.

Clinton, Indiana

Are manufacturers of repressed vitrified shale paving brick of unquestioned merit and also licensees of DUNN'S Wire-Cut-Lug Block, which is the acme of perfection for street paving material.

Write us for samples and prices.

Clinton Paving Brick Company
Clinton, Indiana

C. P. MAYER BRICK CO.

BRIDGEVILLE, PA.

The MAYER BLOCK is Unequaled in Abrasion Test.

The Louisville Machine Co.

Louisville, Ohio

Dies for Clayworking our Specialty.

Brick, Fireproofing, plain and ornamental Hollow Ware Dies, for auger or steam press. Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

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PURINGTON PAVERS

ARE MADE OF

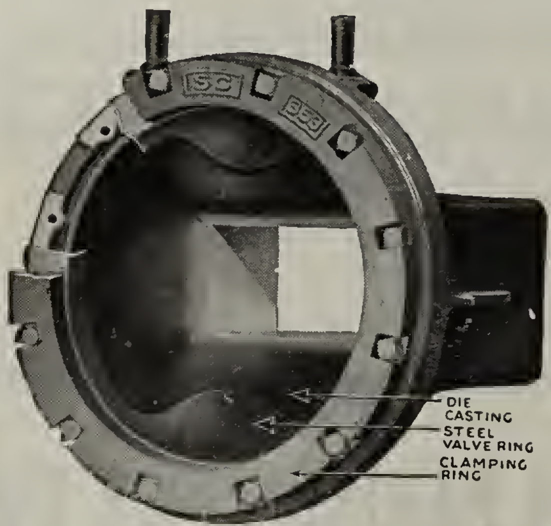
GALESBURG SHALE

PURINGTON PAVING BRICK CO.

GALESBURG, ILL.

Chambers Brothers Co., Philadelphia, Pa.

Brickmaking Machines and Appliances of the Better Kind.

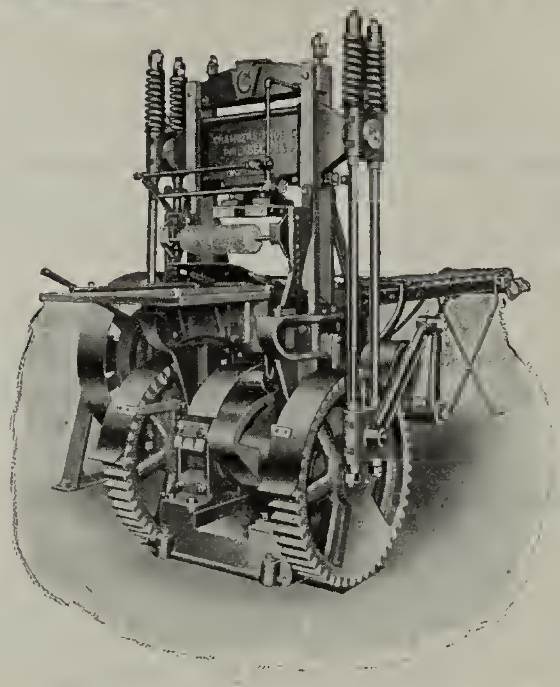


The Chambers Lubricating Die Helps on the Rattler Test.

The lubricant is applied at the point of greatest resistance and is forced into the die under pressure. Contributes to a more uniform movement of clay bar. Gritty shales and fire clays possessing but little plasticity are molded more succesfully with this die. Less power, less waste, better product. Used on various auger machines. Both side and end cut.

Lubricating Side-Cut Brick Die.

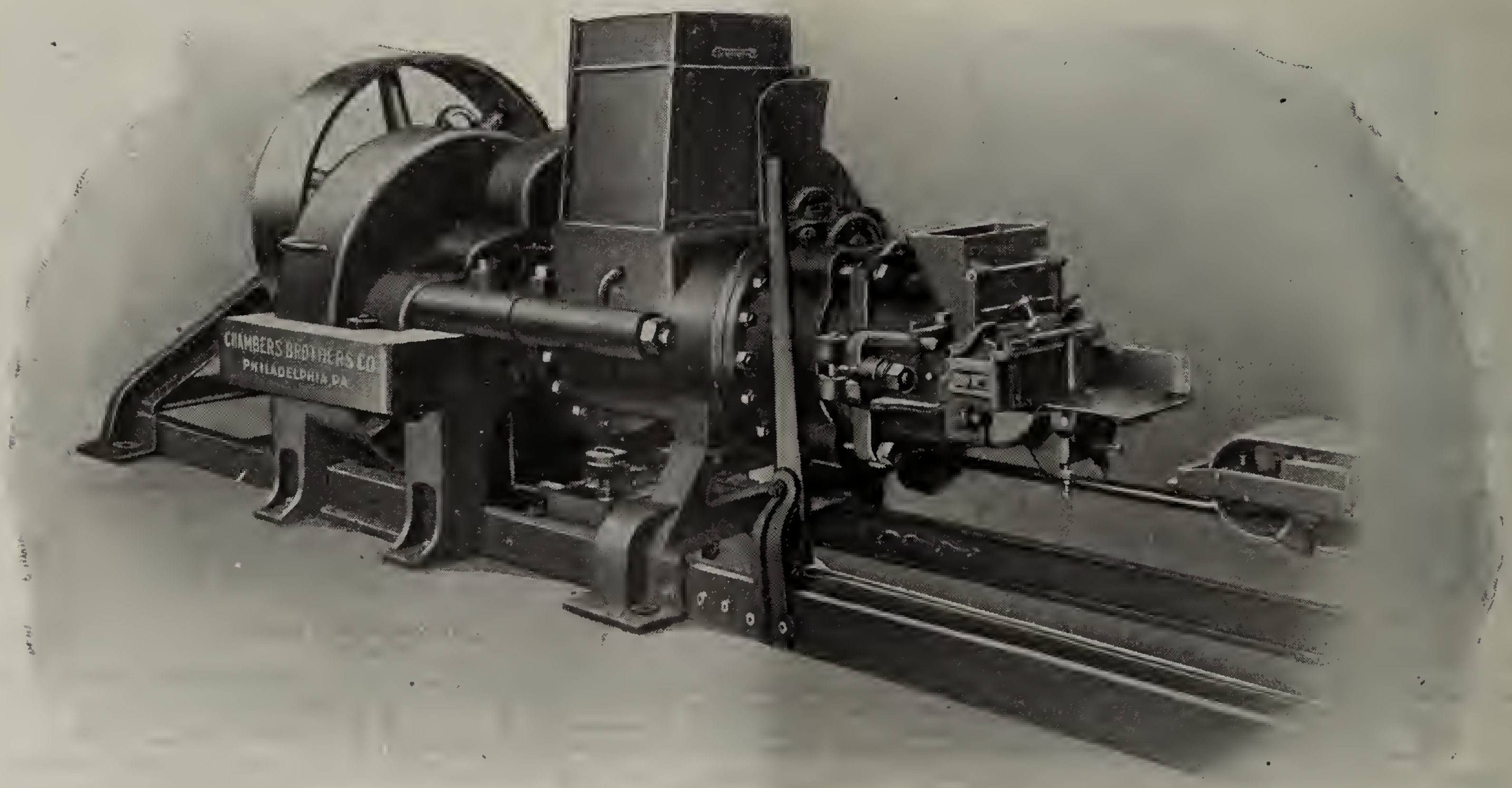
(Patented Feb. 24, 1903.)



THE KEYSTONE REPRESS

A strongly built Crank Press that has found favor with manufacturers of fire brick and furnace blocks. Closely built, with great stiffness in crank shaft.

All cross head slides of liberal dimensions. The feed mechanism is in perfect time and gives a smooth, easy movement to the finished product. Press built in four sizes for different classes of work.

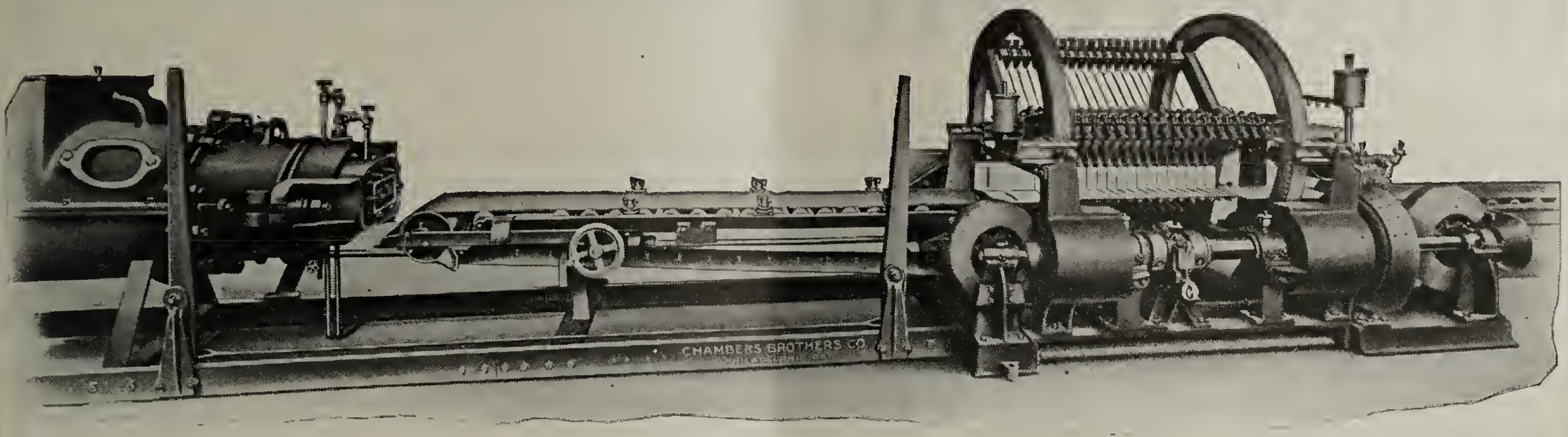


The Keystone Auger Machine---For End-Cut or Side-Cut Products.

Of great strength and large capacity. Single gear type. Gearing enclosed and running in oil. Journals lubricated by circulating oil system.

Chambers Brothers Co., Philadelphia, Pa.

Clayworking Machinery Developed
Through a Careful Consideration of the Criticisms of
Experienced Brick Manufacturers.



THE BRICK CUTTER THAT DOES NOT SWELL THE CLAY-BAR

Built so far as possible, to a standard for the construction of machinery of this class.

We Refer by Permission to

The Mill Hall Brick Works	Mill Hall, Pa.
The Reynoldsville Brick & Tile Co	Reynoldsville, Pa.
The Excelsior Brick Co	Fredonia, Kan.

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The El Paso Brick Co	El Paso, Texas
Sayre & Fisher Co	Sayreville, N. J.
The National Fire Proofing Co	Port Murray Works, N. J.
Yankee Hill Brick Mfg. Co	Lincoln, Neb.
Darlington Clay Products Co	Darlington, Pa.

Cutters Are Being Made on Orders for

The Kier Fire Brick Co	Pittsburgh, Pa.
Euclid Stone & Brick Co	Cleveland, Ohio
W. G. Bush & Co	Nashville, Tenn.

*These Are All Well Known Concerns Whose Managers
Investigated and Then Selected The*

Chambers Multiple Brick Cutter No. 10

"—but *our* clay is different!"

In our 30 years' experience we've often heard that objection raised. The answer to it is this: It makes no difference *how* different your clay is!

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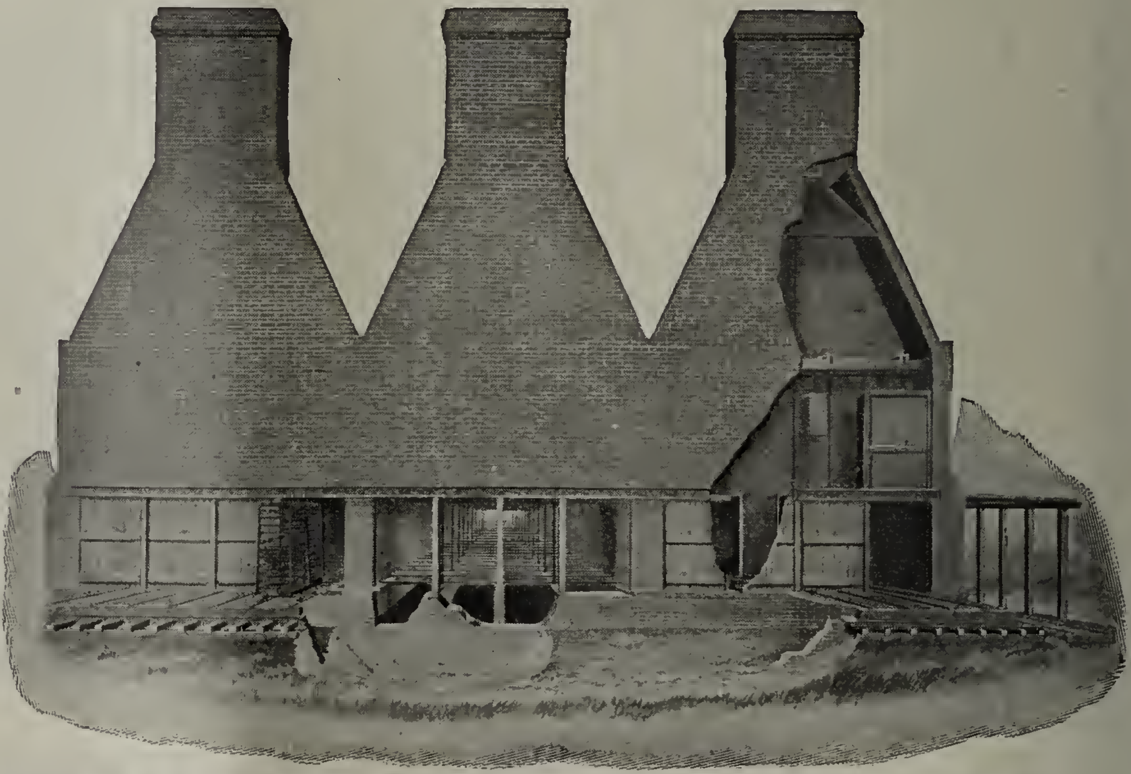

THE CLAY-WORKER

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BRICK BOOSTING IN THE BLUEGRASS.

A Happy Combination of Practical Knowledge, Progressive Ideas and Hustle That Enable the Lexington Brick Company to Meet the Demands of Kentucky Builders.

ONE of the first things one sees on driving up to the main office of the Lexington Brick Co., at Lexington, Ky., is a Build With Brick sign nailed up outside the office door. This suggests that they are boosters of the building brick game, which suggestion is fully verified by further acquaintance with the concern and its methods. The Lexington Brick Co. has been in business thirty-three years or more and is now being operated by the second generation of the Cramers, Harry C. Cramer being vice president and general manager. His father was founder of the business and he himself grew up in it and some five or six years ago his father retired from active management and he has since been the active head of the business. The company has three plants, the main or original plant, with a capacity of 50,000 brick a day, and two open yard plants in different parts of the town, which furnish them equipment for manufacturing as high as 15,000,000 brick a year. At the main factory, which is known as the Netherlands plant they have a stiff mud equipment and they claim to make a very good stiff mud brick, but their trade shows such a preference for the sand molded brick that their stiff mud machine is standing idle and they are making a splendid quality of soft mud, sand molded brick. The clay is a surface clay beginning immediately under the soil and extending to a depth of from three to four feet, after which they get into the iron-like gravel that causes spotting and interferes with smooth working. The clay burns to a dull brownish red that is very attractive and has been used quite extensively in factory work. In fact, many of the unique and attractive new homes being built in Lexington at the present time are being faced with this brick on the choice of the architects who saw in it the possibilities for a splendid effect, especially in some of the darker colors.

Harry C. Cramer, the Genial Manager of the Lexington Brick Company.

Their drying at this plant is done in dry kilns that they have developed themselves. They have six dry rooms, each holding 50,000 brick, a day's capacity, and it requires five days to dry. So their dry kiln just fits in with their producing capacity. The drying is done by steam with coils underneath the racks and means for regulating the steam pressure as a way of governing the temperature and controlling the drying. The first day they use very low pressure, from three to five pounds, which heats up gradually, and they gradually increase the steam pressure from day to day until they have from 35 to 50 pounds in the final drying. They find this method works splendidly with their clay.

The company operates two additional yards, which they have styled the Fayette plant and the Central plant. These plants, which are open air yards, were not built by the Lexington Brick Company, but by competitors who from time to time thought to make a go of the brick business in Lexington, and after they had failed, the Lexington Brick Co. bought in the plants to take care of their steadily increasing trade. They make practically all the rail shipments from the main plant, while they make most of the local deliveries from the open yard plants because it is more convenient to do so. Lately the open yard plants have been hampered considerably in operations by too much rain.

The Netherland plant is operated the year round, while the other two yards are run about seven months. The brick are burned in down draft kilns, of which they have six at the Netherlands plant and five each at the Fayette and Central yards, with a capacity of 350,000 brick each. It takes five days to watersmoke with what they call a smokeless coal, and they finish the burn in six days with steal coal. The three plants give them a yearly output of 15,000,000 brick. Mr. Cramer prides himself on their standard size brick, 8¼x2¼x4. They furnish all the common brick and nearly all the face brick for the adjoining counties, having agencies in all the larger towns. Some of these agencies are lumber companies, and Mr. Cramer said he found the lumber companies were the very best boosters for brick. The town of Lexington uses about 7,000,000 to 8,000,000 brick per year, which leaves them about 7,000,000 for outside shipment. Mr. Harry C. Cramer

Posies and Brick Make an Attractive Appeal to the Prospective Builder.

A Corner in the Display Room Where 100 Varieties of Building Brick Are Shown.

says that they obtain $8.50 per thousand for the kiln run and $9.00 when specifications call for all hard. There is really not a great percentage of soft brick in their burns.

While Mr. Cramer is general manager of the company, he has three able assistants in the superintendents of the three plants. H. J. Williams is in charge of the Netherland plant, while W. P. Munday is superintendent of the Central plant, and E. M. Bailey superintendent of the Fayette yard.

They found business rather quiet this season until along in July, when some good sized contracts were let, including two school buildings, some warehouse buildings and a number of other big projects calling for brick, until now the indications are that they will have enough work before them to keep all the yards busy the balance of the year.

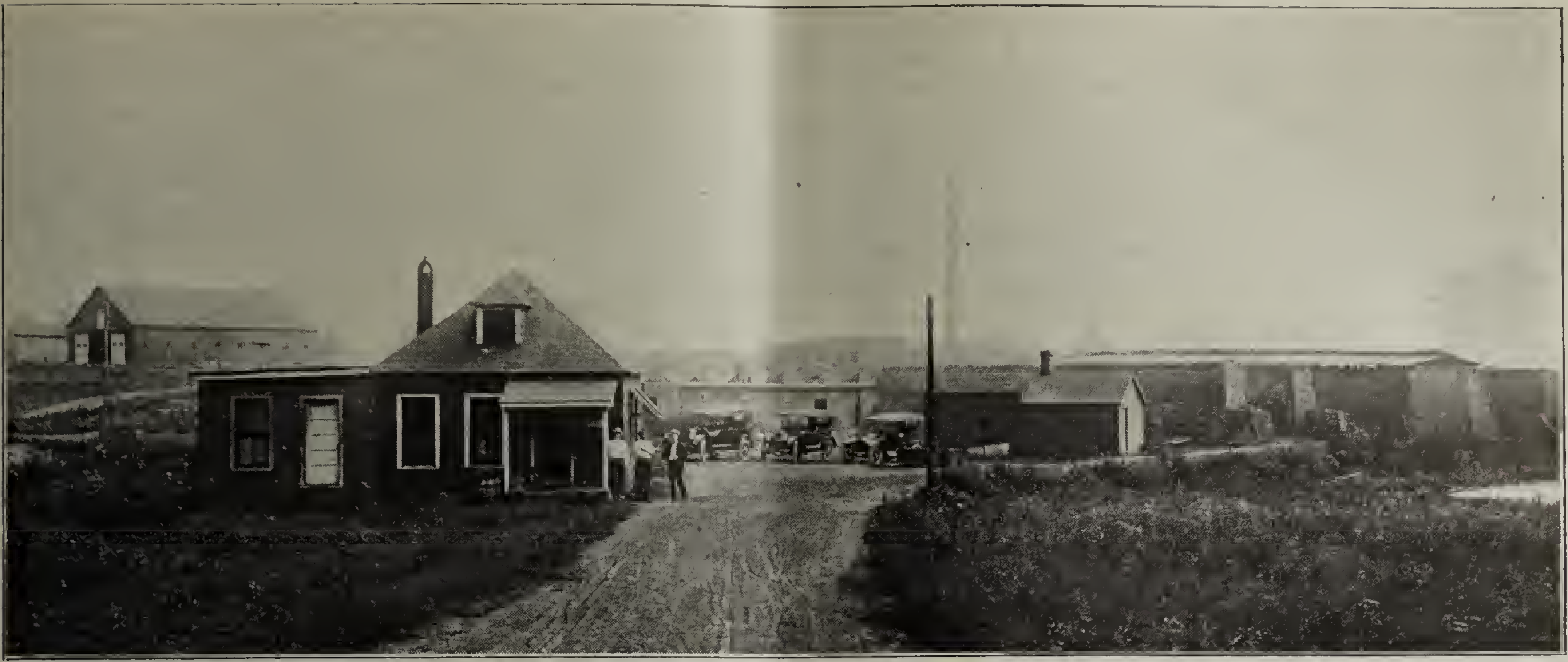
In addition to producing and marketing their own brick, the Lexington Brick Co. have equipped in their main office a beautiful display room of many kinds of face brick for which they are agents. In fact, it is one of the most attractive display rooms that the writer has had the pleasure of looking into. An entire room of the office is given over to it and the interior walls are of panels with an attractive fireplace of light grey brick of rough texture laid with black mortar at one end of the room and a hearth of the same grade brick.

The display panels show more than 100 varieties of texture of brick, representing a product of ten of the leading face brick factories of the country and furnishing practically every color combination that could be desired.

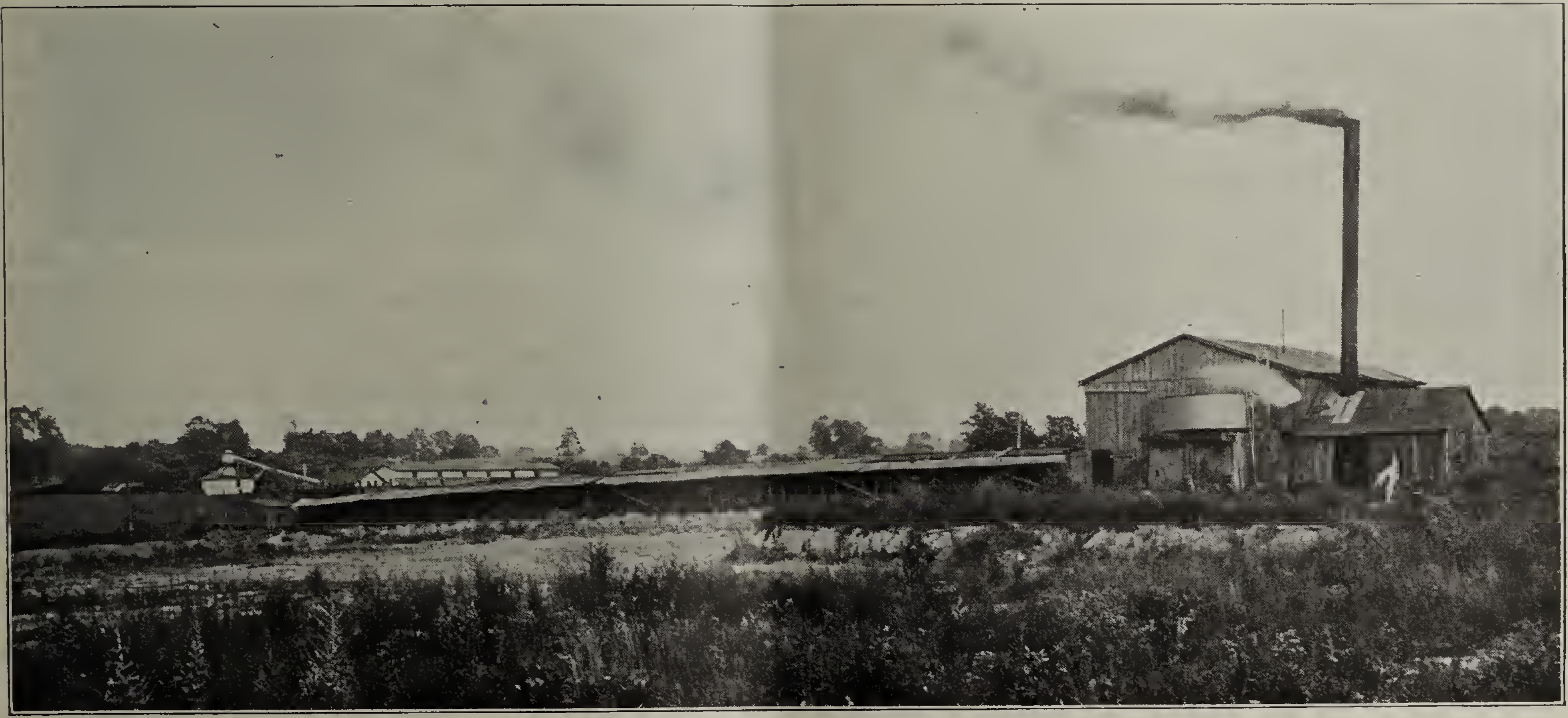
They did not merely equip this room and let it go at that, either, but they have some big automobiles and are ready at any minute to get anybody who is interested in brick, bring them to the display room and take them back again.

The writer was particularly impressed with this go-getting

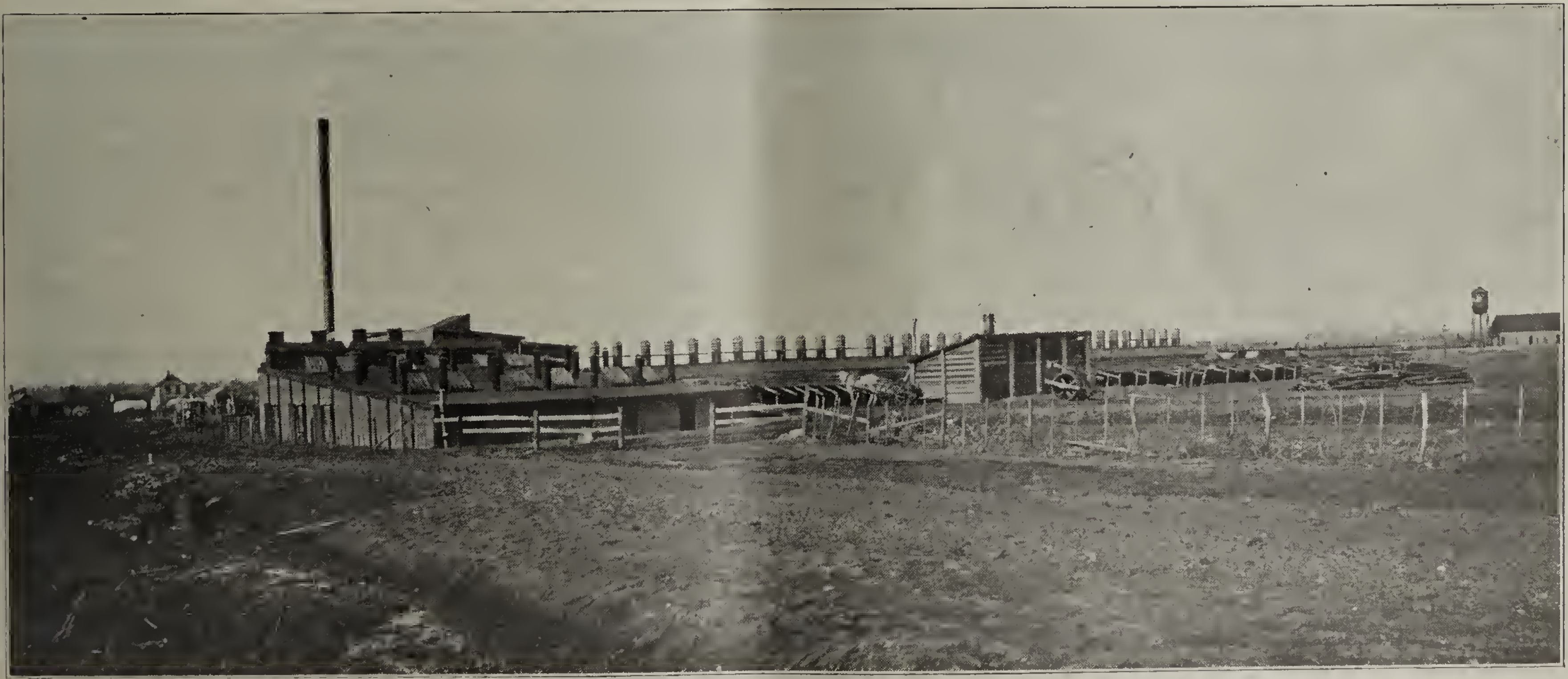
Sales Force and Equipment of the Lexington Brick Company, Which Play an Important Part in Its Success.



General View of the Netherlands Plant of the Lexington Brick Company.



Open Air Dryer and Machine Shed of the Central Plant, Lexington.



The Fayette Plant, the Latest Acquisition of the Lexington Brick Company.

spirit of the Lexington Brick Co., because when he called up the Lexington Brick Co. and asked how was the best way to get out to the plant, the reply came back quick and prompt from Harry C. Cramer: "About the best way for you to get here is for me to come after you."

This was followed by an injunction to wait at the hotel a few minutes and sure enough it was only a few minutes until a big, seven-passenger automobile swung into position and off we went to look over the brick plant and the display room. And we moved, too. In fact, action, prompt and decisive and clean cut, seems to be the dominating characteristic of Mr. Cramer and it is no surprise, therefore, to find that they have built up and maintained successfully a splendid brick business and are able to market their product regularly at a price that is modest, considering the quality of the brick, but is enough to excite the envy of some who have been producing and marketing common brick at an average price considerably below $8.50 a thousand.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

CHAPTER III.

Quartz.

THE MOST COMMON mineral in clay, other than kaolinite, is quartz, or silica sand. Quartz is highly refractory, though less so than kaolinite, and it has an important place in refractory products.

It fuses to a glass at about cone 25 (2966° F.) but it retains its shape to temperatures above cone 30. Its final fusion temperature has not been accurately determined except to the extent that it is completely fused at temperatures below the fusion temperature of kaolinite. The impression seems to prevail among clayworkers that quartz, or its equivalent in sand, is more refractory than clay and that any addition of sand will increase the refractoriness of the clay. This is true of ordinary clays which have a low refractory value, but it is not true of pure clays which approximate kaolinite in their composition. On the contrary, silica when added to such pure clays results in a mixture which fuses at a lower temperature than either the clay or the silica alone, as Seger has shown.

The addition of silica to a very limey clay—one containing 20 to 30 per cent of lime, which is difficult to burn because of the high lime content—would serve to dilute the lime and at the same time assist in the development of a fusible mixture.

The size of the grain of the quartz will have material influence on the rate of fusion and in a finely divided state will more rapidly develop a fusible mixture with the other clay minerals.

Quartz, as sand, is used to reduce plasticity by dilution, to counteract shrinkage both in drying and in burning, and aids in overcoming lamination, particularly if it is coarse and angular.

In some instances fine sand may lower the burning temperature required, but as a rule, it does not improve the burning behavior, frequently quite the contrary, while coarse sand often shows a decided improvement.

The coarse sand reduces the lamination of the clay ware, increases the pore spaces which are important in the drying, and serves as a bonding material, thus improving the quality of the ware to be burned, which results in better burned ware.

In the burning the large grains may be only partially absorbed into the fused matrix and the undissolved remnants serve as binders and give the ware a granitoid texture, which has the greatest resistance to shocks and to temperature changes, especially in vitrified products. Fine sand has less effect on lamination and does not improve the drying qualities, or at least whatever gain there may be in porosity is largley offset by the weaker bond.

In burning to vitrification, as the term is understood in common clay wares, the fine sand is largely absorbed into the fused matrix and the texture of the burned product is glassy in character and frequently subject to heavy loss in cooling cracks.

Silica under heat undergoes physical changes which mineralogists recognize as distinct mineral forms. To the clayworker the feature of importance is expansion. Up to 1600 degrees F. silica decreases in specific gravity and increases in volume about 14 per cent. At higher temperatures it increases in specific gravity and probably accompanied by a corresponding decrease in volume.

Kiln temperatures generally exceed 1600 degrees F., and in this behavior of silica may be a possible explanation why so many fine-grained silicious clays do not have a clear ringing sound when burned.

The silica in the burning first expands materially then perhaps shrinks slightly, and in the cooling expands slightly then shrinks.

It is the cooling expansion which we would suspect as the cause of the trouble. If the grains are round, as they likely are in the fine grained alluvial clays, the expansion cannot be taken up by the pore spaces and there will be a slight rupture of the bond in consequence. Naturally, such a product will not have the clear ringing sound of a perfectly bonded product.

Mica.

Mica is found in nearly all clays and some clays are largely mica, as for instance, some of the micaceous sands of New Jersey, which formerly were put on the market as "Kaolin." A sample of kaolin recently tested had 80 per cent. of mica and silica, the mica largely predominating. The percentage of kaolin was very small.

Mica is a silicate of alumina with some base. There are potash, soda, lithia, iron, lime, and magnesia micas besides micas containing two or more of these bases.

The clay will contain the mica which has resisted the weathering influences in greatest degree, and the potash mica —Muscovite—is the most common.

Muscovite is said to fuse at cone 13, which is above common kiln temperatures. Mixed with kaolin even up to twenty per cent. it seems to have little effect on the fusibility, in other words, it does not readily develop a fusible mixture. This explains why it is so often seen in burned clay wares. The state of division undoubtedly has considerable effect in producing a fusible mixture, and Stull, Vol. IV, Transactions American Ceramic Society, has shown that finely ground mica exerts a fluxing action below cone 4 and that alone it vitrifies to a non-absorbent body below cone 4. Reike, a German investigator, on the other hand, found that mixtures of mica and kaolin in percentages of twenty per cent. mica to eighty per cent. kaolin only reduced the fusion point of the kaolin from cone 35 to cone 34. Mixtures containing as high as forty per cent. of mica only lowered the fusion point to cone 32. It seems inconsistent that a mineral that fuses at cone 13 should, when mixed in large amounts with a clay fusing at cone 35, have less effect than the mixture of two highly refractory bodies, such as kaolin and silica, but the explanation is that the mineral developed bears no relation in its fusing point to the fusing points of the original minerals. This explains why the micaceous sands of New Jersey, mixed with kaolin, produce excellent fire bricks. Stull's work shows vitrification at ordinary kiln temperatures but there may be and evidently is a long range between vitrification and fusion.

Mica, then, in a fine state of division aids in vitrification at ordinary kiln temperatures but requires a higher temperature when present in plates visible to the naked eye.

The point is that a fine state of division permits an intimate mixture and this is essential in developing a fusible mixture. Lumps of kaolin and quartz in a crucible in the proportions of the most fusible mixture will not fuse at the temperature required for that mixture but if finely ground and intimately mixed a eutectic mixture is developed.

Mica cannot be considered as having any serious effect in the burning behavior but under some conditions it will improve the burning qualities.

The behavior of mica indicates how variable may be the problems in burning such complex material as clay.

Lime.

Lime occurs in clays in several mineral forms—as a carbonate (limestone), as a carbonate with magnesia (dolomite), as a sulphate (gypsum), as a constituent of silicate minerals—and it is a serious menace in clay burning operations.

Lime carbonate as pebbles burns to caustic lime, which, when exposed to the weather, slakes, swells and ruptures the product. In large pieces deeply embedded in the ware, the rupture of the ware through hydration of the lime is complete, but small pieces cannot exert sufficient pressure to cause rupture except when near the surface, and in such instances circular discs are flaked off. This surface effect of lime is commonly termed "popping."

The dissociation temperature of lime carbonate is about cone 014 (1526° F.) which is lower than commercial kiln temperatures, and in consequence any lime carbonate in the clay is certain to be converted into lime, and "popping" follows.

Lime sulphate is present in clays as gypsum, and it is also developed by the oxidation of sulphide minerals resulting in sulphuric acid which reacts with the lime carbonate to form the sulphate. The dirty white coating which comes to the surface of clay wares in the drying is largely lime sulphate. Lime sulphate dissociates at higher temperatures than the carbonate, especially under oxidizing kiln conditions, and in consequence in many kiln operations passes through the kiln unchanged. The proof of this is the "scum" on many of our burned wares.

Clays which "pop" when burned in periodic kilns may not do so when burned in continuous kilns, especially those which have no advanced heating or water-smoking flue, in which the water-smoking is done with gases ladened with sulphur. Under such conditions the lime carbonate is converted into sulphate, which, as above mentioned, does not dissociate at low temperatures, and at higher temperatures any lime set free enters into and becomes a part of a fusible mixture and is permanently locked up in some silicate formation.

Lime in a finely divided state or as a constituent of a silicate mineral or any mineral which enters into a fusible mixture is a serious element in clay bodies, because of the fusibility of the mixture containing lime. It has been shown by investigators of fusible mixtures that lime with kaolin develops two or three eutetic mixtures defining the term in the sense that it is the most fusible mixture of any mixture of the same minerals in proportions approximating those of the eutetic mixture, which is our interpretation of eutetic.

The effect of these eutetic mixtures, or if you please, consider it simply from the standpoint of a simple flux, becoming active at a critical temperature, is a rapid development of vitrification—a decrease in viscosity.

In any commercial kiln there is a difference of temperature, and a clay to be of commercial value must produce marketable ware within such differences of temperature. In up-draft kilns we must hold the temperature in the bottom at a maximum until the heat works to the top; but we never attain the same temperature in the top as that in the bottom.

Similarly in down-draft kilns, we must hold the heat in the top until we can get the ware burned to the bottom. We consider three cones the minimum limit of variation of temperatures in down draft kilns, and no other type of kiln has such a small limit.

This statement requires some explanation. It is possible to attain the same temperature in the top and bottom of a down-draft kiln, but at considerable expense in fuel and time, which the majority of wares will not stand. Up and down-draft kilns develop more uniform temperatures, but their application is limited.

If the clay, to produce marketable ware, will only stand a range of two cones, or one cone, we must sacrifice the ware in one part of the kiln to get good ware in another part. This is the weakness of limey clays. The lime develops mixtures which fuse so rapidly that in many instances it is impossible to get a properly bonded ware throughout the kiln.

Under a subsequent discussion of the burning behavior of clays will be found curves, in which are shown the burning ranges of a number of clays, including limey clays.

One cannot determine how serious the lime trouble may be from a casual examination of clays. We have seen shales interstratified with limestone in a prohibitive degree, provided the limestone developed the usual effect, but which in use did not "pop," and the burning range was satisfactory for commercial operation. Our conclusion was, that the limestone was impure, probably earthy, and that the granules of this material burned to a lime-alumina-silicate, in itself quite in-

(Continued on page 182.)

Some Notes on Brick Road Construction

By H. E. BILGER, Road Engineer, Illinois State Highway Department.*

DURING the last five or six years much progress has been made in the further development of vitrified paving block, as well as in the methods of assembling the various materials in the construction of brick roads. To the taxpaying public the result of this progress means that for a smaller construction cost than has heretofore been paid there will be obtained a smoother, and, consequently, a much more serviceable brick road than was practicable to build by the old method. An attempt will be made to discuss in detail some particular features of modern brick-road construction.

It will be assumed that the details of both the horizontal and the vertical alignment, as well as the location of the proposed improvement, have been cared for in a manner strictly commensurate with the high type of the surfacing material. Needless to say that the more rigid and more costly the surfacing material for highway improvement, the more nearly should the improved alignment approach a level tangent. This need not be interpreted to mean that in brick-road construction excessive cuts and fills are warranted in order to reduce the grades below some 3 or 4 per cent., but rather, that the term realignment is merely a relative one, and under similar conditions a greater expense for grading is warranted for the construction of a brick road than for an earth, gravel, macadam or any kind of a bituminous road.

H. E. Bilger, Springfield, Ill.

The Subgrade.

It seems hardly necessary to state that the subgrade upon which is to be placed the artificial foundation for the brick surface should be dry, smooth, uniformly compacted, and conform strictly with the requirements of the plans. A subgrade not uniformly compacted might be tolerated for a very resilient type of improvement, such as gravel or macadam, for as it yields in places the surfacing material will adjust itself accordingly without appreciable damage and oftentimes even without detection. The success of such rigid types of improvement as the brick road, however, require either that there be no settlement of the subgrade whatever, or that the settlement be uniformly distributed, which is a treacherous matter to depend upon.

A safe procedure is to provide adequately for underground drainage where necessary, and then to compact thoroughly the subgrade with a roller of such design as to exert a pressure of at least 300 pounds per inch of width of tread on one wheel. Every experience indicates that a properly drained subgrade compacted by such a roller is able to sustain safely a 7-inch rigid slab, as concrete or brick, carrying any load now traveling upon the rural highways of Illinois. Mathematical calculations are of but little avail when applied to the design of an economic pavement slab. The amount of load to be carried, as well as its manner of application and distribution, are such indefinite factors that nothing but correspondingly indefinite results can be obtained by their use as data for designing the economic slab.

In sections of the country where gravel, rock or similar material can be placed upon the road at a lower cost per unit volume than sand or almost any character of earth, there can arise conditions that warrant the use of an artificial mineral sub-base, such as the Telford, in order to support properly the concrete or other foundation upon which the brick surface is placed. Conditions that frequently encourage the use of a Telford sub-base are in reality but matters of drainage, for the primary function of such a base is to float or bridge the upper base over an earth sub-grade that has not been provided with adequate drainage. The Telford base merely serves to distribute the load over a larger area, this distribution being necessitated by the very fact of the presence of moisture.

If found, there have not yet been reported in the State of Illinois any conditions that can warrant, economically, the use of a Telford or similar sub-base in addition to the base proper that carries the brick-wearing surface. The entire matter is one of drainage, for our experience has invariably proven that any properly prepared sand or earth subgrade can support safely a 7-inch rigid slab carrying the heaviest loads being encountered. If gravel or rock were cheaper in Illinois than earth and drain tile, there is little question but what the Telford base would have long ago found its way into the make-up of road improvement. Necessity having again proven to be the mother of invention, we have been driven to the problem of draining adequately the subgrade so as to carry directly thereon the rigid slab without the use of any mineral sub-base.

Use of Old Foundations.

While old gravel and macadam roads can be used to great advantage as foundations for new brick surfaces, yet where such roads do not exist it seems more advisable that the foundation be of Portland cement concrete rather than either gravel or macadam, even though of a 2-inch greater depth than the concrete. To utilize economically a gravel or macadam road as the base for a brick surface, there is required greater skill than where all the work is to be new. The establishment of the grade line is a delicate matter, inasmuch as a variation of only 1 inch may require either undue scarifying of the old surface or the unwarranted addition of new gravel or stone which should be united with the old. In order to establish this grade line properly it is frequently necessary to cross section the old road at intervals of 50 feet, this depending, of course, upon the condition of the surface and the regularity of its profile. After having worked out the economic position of the grade line for each station along the line of the improvement, it is usually found necessary that the old surface be scarified to some extent in order that the higher places may be removed to make room for a sufficient quantity of the bed for the brick, and that the lower places may be filled up with fresh gravel or stone to avoid an excessive depth of this bed. The scarified, reshaped and rolled surface should conform, with a permissible variation either way of one-half inch, to the contour of the finished brick surface. This rolling should be done with the roller used for the subgrade work, and the compaction of the material should be most thorough.

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* Paper presented at Conference in Highway Engineering at Kansas State Agricultural College, Manhattan, Kansas, March 4, 1916.

The curb or edging, if used, may be built of concrete, having a width of from 4 to 6 inches at the top and from 6 to 8 inches at the bottom, the total height of the edging being from 12 to 15 inches. While the edging is not really necessary as a pavement feature, yet its use is recommended because of the great convenience it offers as a guide for the template used to locate to a nicety the areas to be scarified. The edging would be constructed, of course, before any of the road is scarified. With the edgings completed the road can be scarified and easily reshaped and rolled to the proper cross section and to an alignment conforming strictly with that of the edgings. Where edgings are not used it is necessary that there be set up true to line and grade temporary side forms that will carry the template used as a guide for reshaping the old road. From the expense of furnishing, setting up and later removing these temporary side forms there is added nothing of value to the completed pavement. In view of this fact, and also in view of the precision of alignment furnished by the concrete edgings, it will be appreciated why the edgings are generally used, and more particularly when it is considered that the top width of each edging acts simply as a substitute for a corresponding width of brick surface. Upon having thus prepared the old road to serve as a base, it is ready to receive the bedding course upon which the brick are set.

Monolithic Construction. View Showing Template Used.
Note How the Work is Concentrated.

New Concrete Foundation.

While there may be found conditions that would warrant the construction of a new gravel or macadam foundation to carry a brick surface, yet these conditions are rare. The Portland cement concrete foundation constitutes the best that has yet been devised for brick roads. For the heaviest rural highway traffic in Illinois the fact seems demonstrated by experience that for an 18-foot road a 4½-inch concrete base is entirely satisfactory, and for a 10-foot one, 4 inches will suffice. These dimensions have been used under various soil and traffic conditions, and from every indication they are well on the side of safety.

It has further been demonstrated that the mixture for these bases need not be richer than 1-3½-6. This mixture has been used extensively with various qualities of aggregates. With reasonably satisfactory inspection of the work it is uneconomical to require that the fine and the coarse aggregates be used separately. The use of mixed aggregates, usually termed unscreened gravel, should be permitted with the restriction that one part by volume of cement shall be used to each 3½ parts of fine aggregate contained in the gravel, and that the ratio of the fine to the coarse aggregate shall not be less than 3½ to 6, nor greater than 7 to 6. With the fine aggregate ratio running at the permissible high figure, the value of the additional cement required would be about 7 cents per square yard of base. It has been learned from specific cases that where unscreened gravel was shipped by rail for long distances the saving in the purchase and the transportation of the unscreened material as against separated aggregates amounted to more than 7 cents per square yard of base. These were extreme cases in transporting material a long distance, so under conditions where local materials are available the saving by the use of unscreened gravel would be still more. In the construction of county roads, usually having a width of from 10 to 18 feet, there is not conveniently available on the prepared subgrade a sufficient space to pile and use the aggregates separately. In street work the situation is entirely different for there is abundant space to store the separated materials.

Monolithic Construction. Pavement Ready for Grouting.
Note Also the Roller That is Used.

The consistency with which the concrete for the base should be mixed depends upon whether the road is to be constructed monolithic, or with a cushion or bed of some substantial thickness between the base and the brick. If the latter method is to be followed the concrete can be of a rather wet consistency in order to keep down the cost of the work, but of course, the consistency should not be such as would permit the separation of the aggregates. If the monolithic method is to be followed a comparatively dry consistency is required in order that the brick may be placed upon the concrete almost immediately. For monolithic work it is essential that the consistency of the concrete be uniform in order that local depressions may not develop due to the weight of the brick and the process of rolling.

Side Forms, Mortar Bed, Etc.

For the construction of a brick road having a sand-cement bed wood forms are permitted, inasmuch as these forms must remain in place until at least 24 hours after the pavement is grouted, which means about two weeks after the concrete base is laid. The expense of providing a sufficient length of steel forms to remain in place for two weeks would not be warranted by the advantages gained. For monolithic work, however, steel forms should be required, for the precision of alignment needed to harmonize with the smoothness of the pavement can usually be gotten only by their use.

The specifications of the Illinois Highway Department, edition of March, 1916, provide for both methods of constructing brick roads. By one method the brick are bedded upon a ¾-inch layer of dry mortar of a 1 to 4 mix, and by the other they are built monolithic with the base, a 3/16-inch layer of dry mortar of 1 to 3 mix being placed on the wet base as it is struck off. The use of the sand cushion as such has been abandoned.

By the monolithic method, the order of procedure is practically identical with that in which a sand cushion is used, except that for any particular day's work only such a length of the base is covered by the mortar as can be covered with brick the same day. All of the brick laid on any particular day should be rolled on that day, even though the grouting may not be done until a day or so later. It is essential that the brick not be allowed to remain on the mortar bed over night without being rolled to a true and uniform surface, for if the mortar bed becomes moistened and sets, no reasonable amount of rolling can produce the smoothness desired.

By the monolithic method with concrete base, the mortar bed and the brick are all placed at practically the same time, or so nearly at the same time that within a period of from 5 to 15 minutes after the subgrade has been covered with concrete, the brick are set to place. Usually not more than 10 or 15 linear feet of the base is ever exposed without being covered with brick.

Immediately upon placing the concrete on the subgrade it is roughly leveled off with shovels to the approximate thickness desired as determined by a light wood template used as a gauge. For the success of the monolithic construction the use of a rigid steel template to strike off the base is essential. The template thus far used has been of the multiple type, consisting of a 6-inch I-beam in front and a 6-inch channel behind the two, being spaced two feet apart and riding on four rollers which are suported by the steel side forms. The lower or cutting edge of the front template is located three-sixteenths of an inch below the corresponding edge of the rear template. When a 4-inch brick is used the lower edge of the rear template is set exactly 4 inches below the top of the steel forms. The space between the two templates is kept filled with dry mortar consisting of one part cement to three parts sand. As the template is drawn forward by a cable attached to the mixer the base is struck off to a smooth surface and a 3/16-inch layer of the dry mortar is distributed evenly over the wet concrete.

After the greater portion of the culling of the brick is done at the pile at the side of the road, the acceptable brick are carried to the setters on pallets and placed in stacks upon the brick pavement with the lugs all in one direction. Inasmuch as the final rolling of the brick should be done within thirty minutes from the time the concrete is laid, it is important that the culling after their having been laid in the pavement be kept to a minimum. The brick are then set upon the mortar by men standing on the brick already laid. The rolling of the brick is usually done with two-section 800-pound roller, about 24 inches in diameter and about 30 inches long. One man can readily operate the roller.

Just before the grouting begins the surface of the brick is sprinkled with water to avoid absorption from the grout. The grout filler consists of a one to one mix of cement and sand, the sand not containing more than 3 per cent. by weight of organic matter and clay combined, nor more than one-half of 1 per cent. of organic matter. The sand should be rather uniformly graded from the finest to the coarsest particles, and should all be such size as to pass through a 1/16-inch square mesh sieve. Not more than 30 per cent. by volume, however, should pass a sieve having 50 meshes to the inch.

The process of grouting the brick must be done by at least two, and usually by three applications. The grout for the first application is mixed extremely thin so as to assure that it will find its way entirely to the bottom of the brick and into all spaces and recesses around each individual brick. At this application the joints are completely filled, but within a short time the grout will settle down a distance of a half-inch or more below the surface of the brick. For the second application the grout is mixed to about the consistency of thick cream. The behavior of the grout while setting must be watched very closely in order that the joints may be kept entirely full and be struck off by the squeegee flush with the surface of the brick.

While working the squeegee at an angle of about 45 degrees with the pavement the grout filler is cleaned from off the surface of the brick and the joints are entirely filled, leaving no unequalities at the edges of the brick to break down under the

State Aid Road 4 Miles Northeast of Springfield, Ill. Pavement to be 18 ft. Wide, 9 ft. of Brick with 4½-ft. Concrete Shoulders. Concrete Base and Shoulders Built Monolithic. Mix for Base 1-3½-6; for Shoulders 1-1¾-3. Concrete in Foreground Being Cured Under One Inch Covering of Sand.

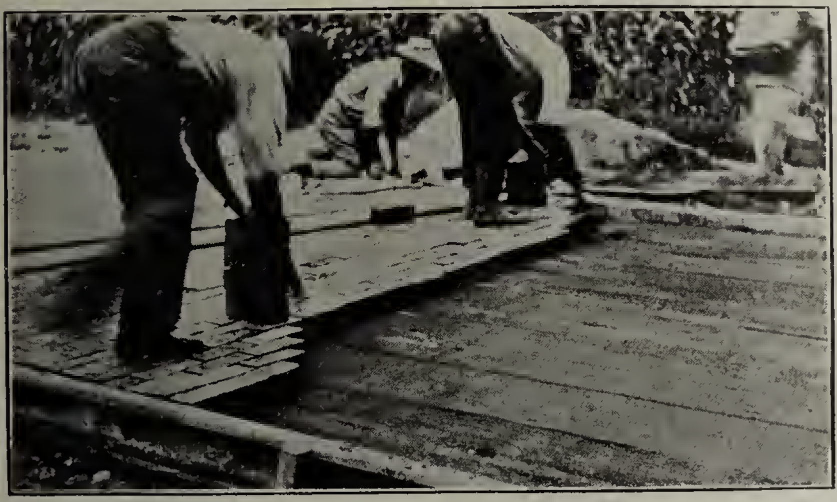
Monolithic Construction. View Showing Edge of Road. Note that the Grout Filler Extends to the Bottom of the Brick.

action of traffic. The next day after grouting the brick the steel forms are taken down and moved forward for the work of the following day.

The curing of the pavement consists of covering it with about a ¾-inch layer of earth and keeping the earth moist for some four or five days. After at least one week from the time the pavement is grouted the grading of the side roads immediately adjacent to the brick can begin, and within three weeks after the grouting the pavement is in proper condition for traffic.

Some Advantages of the Monolithic Type.

The greatest advantage in the monolithic method of brick road construction consists of the high degree of assurance that all of the features contemplated by the specifications will actually be realized in the completed pavement. Practically all of the hazards inherent in the very use of the sand cushion are entirely eliminated, and the method offers a straightforward and definite process in the construction of the pavement. Because of the mortar bed remaining in place the grout filler finds its way entirely to the bottom of the brick. The completed surface is smoother and more uniform than is practicable to get on a commercial scale by the use of a sand cushion. The inconvenience of constructing a curb or edging is entirely done away with, and the brick themselves extend entirely to the edges of the pavement. Practically all of the rumbling characteristic of brick pavements on a sand cushion is eliminated, and about the only noise is the sharp click of the horses' shoes.



Monolithic Construction. A Strip of the Concrete Base Covered With a Thin Film of Dry Mortar. Note the Plank that is Used by the Carriers to Walk Upon as They Come Onto the Pavement. The Man Who is Doing the Batting is Seen About 6 Feet in the Rear of the Brick Layers.

Under normal conditions the construction cost by the monolithic method is reduced by some 10 to 15 cents per square yard. This reduction is due primarily to the fact that the work of the entire force of about 25 men is confined within a radius of about 30 feet. A much greater efficiency can be obtained under these conditions than where a part of the force is one-half of a mile down the road placing the concrete base, another part half the distance away placing the sand cushion, a third part in some other place setting the brick, and a fourth part back the other way grouting the brick. It is evident that with the labor force scattered in this manner it is not possible to carry on road construction at as low a cost as when the entire force is brought practically shoulder to shoulder with one another and the whole work is directed by one foreman.

With the Federal Trade Commission at Washington offering encouragement and assistance in association work, there should not be any hesitancy about the trade getting together everywhere and getting more profits out of the business.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

SPEAKING IN A general way, New Jersey brickmakers are enjoying a prosperous season. Their principal difficulty is to obtain labor, a proposition which none of them have solved to their own satisfaction as yet. When munition plants pay from $3 to $5 a day for what is virtually unskilled labor, it is not easy for brick makers to secure sufficient help to do their work. Some have solved it with wages which seem in a way exhorbitant, and which they could not have paid, only brick has remained very high all the season.

The price at New Jersey delivery points is now from $7.50 to $8.25. Few are sold at the outside price, and perhaps fewer still at the inside, but this represents the range of values which have been noted within the past week. Common brick is hard to get to the job because of the uncertainty of railroad transportation. A considerable number of cars consigned to important jobs were lost in the Black Tom disaster on July 30.

The Hackensack Brick Company at Hackensack is doing the largest business in its history. Buyers take this product before it is cold, and several kilns have been loaded while the brick were still hot. Good prices have prevailed, but they have been offset in some degree by the high price of labor.

The Merhoff interests at Hackensack are continuing operations, though in a smaller degree than formerly, when the original members of the family were alive. Ten yards at Hackensack and Little Ferry are working this year, though the proportionate output is less. High prices prevail and the brick is taken as fast as it is made.

M. L. and M. B. Gardner are operating to about capacity, and the same observation applies to E. M. Schmultz. Both these concerns are doing a good business, and they clear their yards as soon as the burnings are ready for shipment. Good prices are obtained.

In the Raritan district the situation is the same as it is elsewhere in New Jersey. Help is scarce and many manufacturers have been forced to advance wages to the point where profit almost vanishes. Building is active and demand continues strong. In most instances $8.00 to $8.25 is easily obtained, and buyers have difficulty in finding brick at these figures. All manufacturers deliver their kilns as quickly as they can after burning, and get a new one in. Uncovered yards have suffered because of the wet weather and the output has decreased in some instances.

Sayre & Fisher, of Sayreville, report all their works operating to capacity and orders coming in daily, which frequently exceed the quantity of brick on hand. Their face-brick department has been active all the season and has ample orders to keep them busy right up to winter.

The Atlantic Terra Cotta Company is operating its Perth Amboy plant to capacity. It has sufficient orders for its architectural terra cotta to keep up its present activities till cold weather comes and beyond. More architectural terra cotta has been used this year than ever before, and this firm has received its share of orders. Its designs are original and made by artists of ability. Because of this and because of the excellent care it takes of its customers its business grows steadily regardless of general conditions.

The Greenwood Pottery Company, of Trenton, suffered the loss of its entire plant by fire and three firemen were seriously injured. The loss is about $75,000, fully insured. Little delay was caused in filling orders, and the new plant will be ready speedily. The pottery business is too good to allow a firm to wait long before rebuilding.

New Jersey potters have begun on the second half of what has been thus far a very prosperous year. Sales have continued large all the year, and orders ahead now are ample to keep them going all the remainder of the season. The impossibility of obtaining pottery from abroad throws much business to New Jersey manufacturers and they are profiting proportionately.

A. L. B.

PRACTICAL TESTS

Of Hollow Building Tile and Detroit Made Common Brick, Conducted Under the Supervision of Prof. F. N. Menefee, of the Engineering Staff of the University of Michigan.

FOREWORD.

IN AN EFFORT to learn the real value of common made Detroit brick as compared with the building material known as hollow tile, the Detroit Brick Manufacturers and Dealers' Association, while realizing the value of the standard tests of brick, for comparing different brick, felt that machine tests gave misleading results as to the resisting qualities in actual construction. Accordingly, Prof. F. N. Menefee, of the Engineering Staff of the University of Michigan, was engaged to plan and make practical tests, which would more nearly show the true value of both hollow tile and common brick as used in bearing walls for building purposes. It was also the purpose of these tests to learn the comparative crushing resistance of hollow tile, as built in walls, when laid on end (vertical) and on the side (horizontal).

So far as is known, this is the first time in the United States that tests of this nature have been made. They are, therefore, doubly interesting.

ENGINEERING DEPARTMENT
University of Michigan
F. N. MENEFEE
Civil and Hydraulic Engineer

Ann Arbor, Mich., May 19, 1915.

Mr. William B. Wreford, Manager,
Detroit Brick Manufacturers & Dealers Ass'n.,
Detroit, Michigan.

Dear Sir:

I beg to submit the following by way of report on the comparative tests of a common brick and a hollow building tile wall.

Object of Test.

The object of the test was to discover which of a tile wall and of a brick wall of like dimensions would stand the greatest compressive load.

Procedure.

Preparation for Loading

After figuring on loading with sand, pig iron and brick, it was decided that the brick loading was cheaper and more feasible. Using the approximately known strength of tile and brick as shown by the testing machine, it was estimated that the maximum load, which either would hold, would be in the neighborhood of 50,000 pounds per running foot of 8″ wall, with the chances in favor of a failure before that figure was reached, due to the height of the wall.

LAYOUT OF TEST WALLS

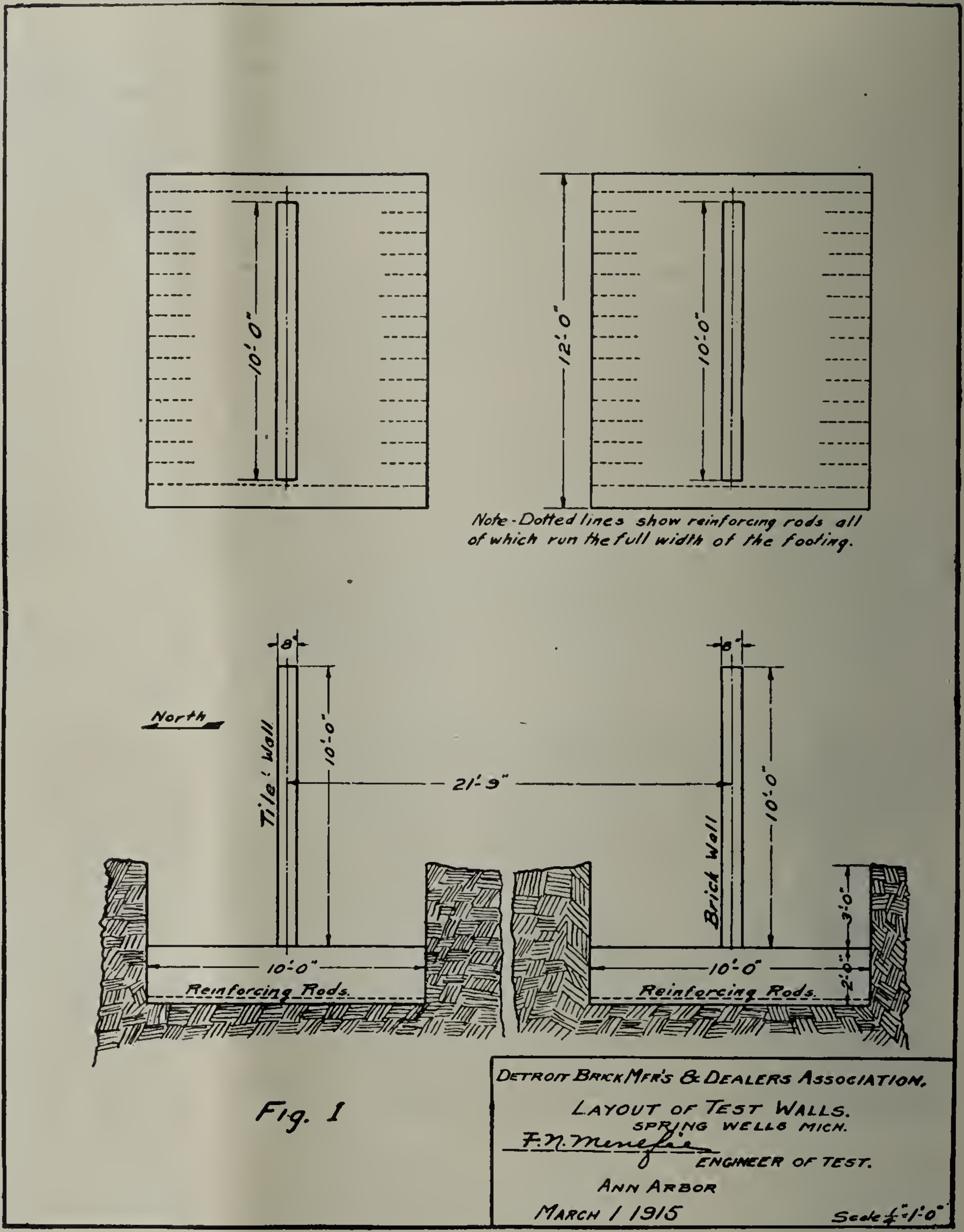


Fig. 1

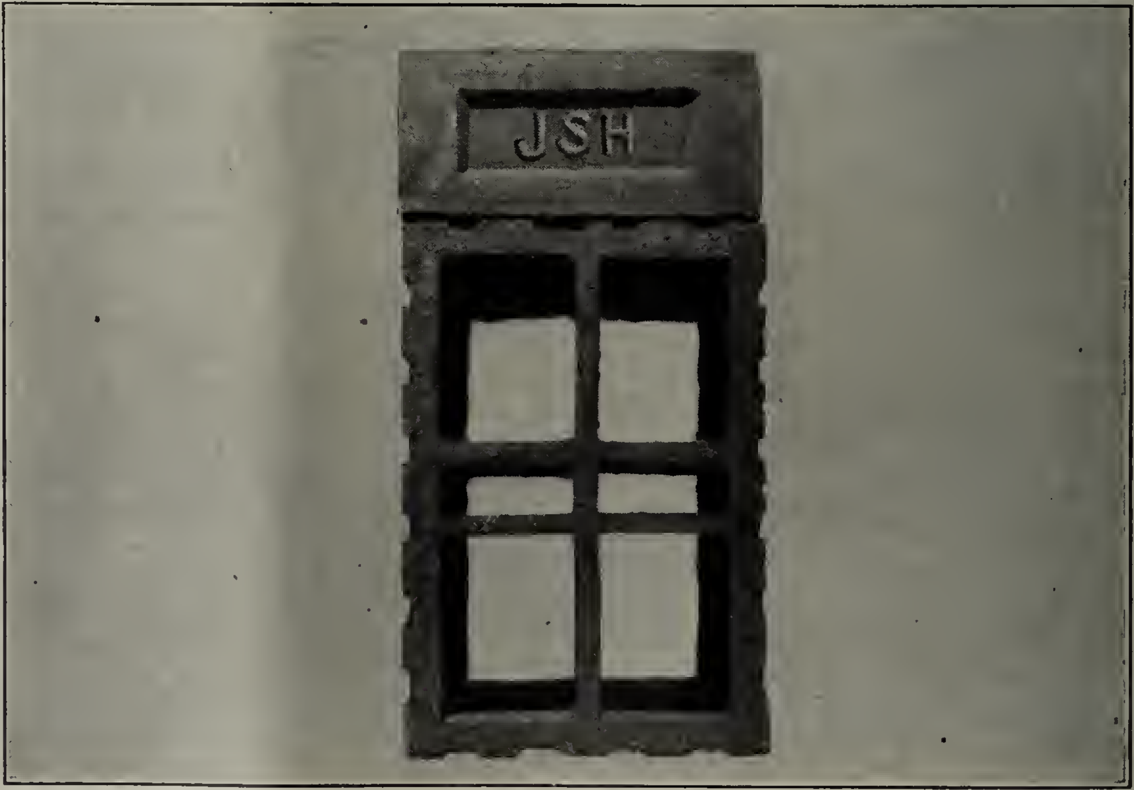


Photo 1—The brick used were what are known as common brick, First, Soft Mud, type. Manufactured in Detroit and taken from the kiln with no idea of selection.

The tile were 8x12x12-in., bought in open market in Detroit and were 6 cell partition type, there being two ½-in. webs across the short dimensions as its center close enough together to afford a very good bearing surface to adjacent tile above and below.

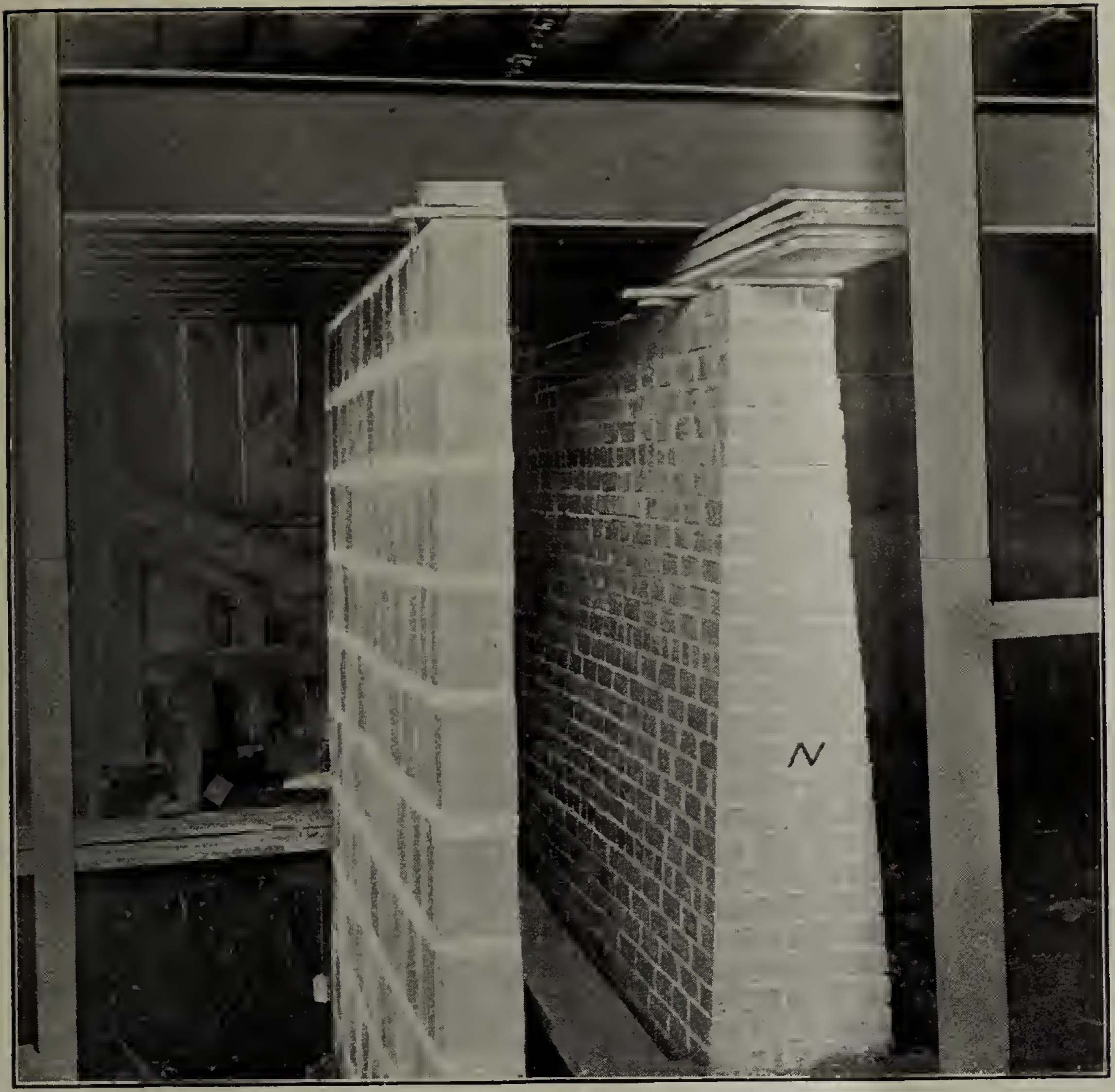


Photo 2—Upon completion of the test walls, additoinal walls were built which it was thought would catch the load when one or the other of the test walls failed.

Photo 3—These walls were designed entirely for compressive load and naturally would develop small resistance to over turning.

A height of 10′ was decided on, as being enough to introduce columnar action without being prohibitive from the standpoint of loading. The length 10′ was thought enough to make a stable support for an overhanging load on both sides, and to warrant drawing conclusions from as to walls of greater length.

With the assumed maximum load of 50,000 pounds per running foot of each wall, the footings upon which the walls were to rest were designed to carry 500,000 pounds each. They were each 10′x12′x2′ thick, properly reinforced and set at the same elevation about 3′ below the ground surface. See Fig. 1. The footings were placed January 21 and 22, 1915.

In order that the walls might not be affected by the cold, and that the wind might not influence the weight on either wall during the test, a temporary building 26′x50′x30′ high was erected around the pits in which the footings rested.

Mr. M. S. Strehl, a member of the Bricklayers, Masons and Plasterers Union of America (card No. 47569), was employed to build the tile and brick wall. He was given to understand that he was responsible to me only and was told by me to make up a first-class wall in each case. The brick used were what is known as common brick, first soft mud type, manufactured in Detroit and taken from the kiln with no idea of selection. As it turned out, there were none of the harder burned arch brick in the wall. The tile were 8″x12″x12″, bought in open market in Detroit, and were 6-celled partitioned type, there being two ½-inch webs across the short dimension at the center close enough together to afford a very good bearing surface to adjacent tiles above and below. See Photo 1.

The walls were built on March 3, 4 and 5. The mortar mixture was one bag of cement, one wheelbarrow of sand, one pail of lime. This mixture was Mr. Strehl's choice. A fire was kept burning in a salamander for two nights to insure final set of the mortar.

Upon completion of the test walls, additional walls were built which it was thought would catch the load when one or the other of the test walls failed. They rested on the footings previously described, were of brick, 2′ wide at the bottom, 1′ at the top, 9′ 9″ high, with a cushion of 1″ boards on top coming to within a fraction of an inch of the bottom of the long I beams. These walls were designed entirely for a compressive load and naturally would develop small resistance to overturning. See Photos 2 and 3. After completion of the walls the building was locked up for 33 days.

On April 6, ten 15″ 42-pound I beams, 40′ long were placed symmetrically across the wall, as shown in Photo 4. The walls were 21′ 9″ apart, center to center, allowing a 9′x1¼′ overhang of the 40′ I-beams. This overhang was previously computed to make the tangent to the beams at the walls horizontal, and the load on the walls vertical, this avoiding any side thrust or eccentricity of load.

On April 10, the small I beams resting on and running acrosswise of the large I-beams were placed 1′ apart, this forming a gridiron of I-beams 15′x40′. Over this was laid a floor of 1″ boards upon which to place the load. See Photo 4.

Method of Loading

The loading floor was about 8′ 8″ above the ground, making it necessary

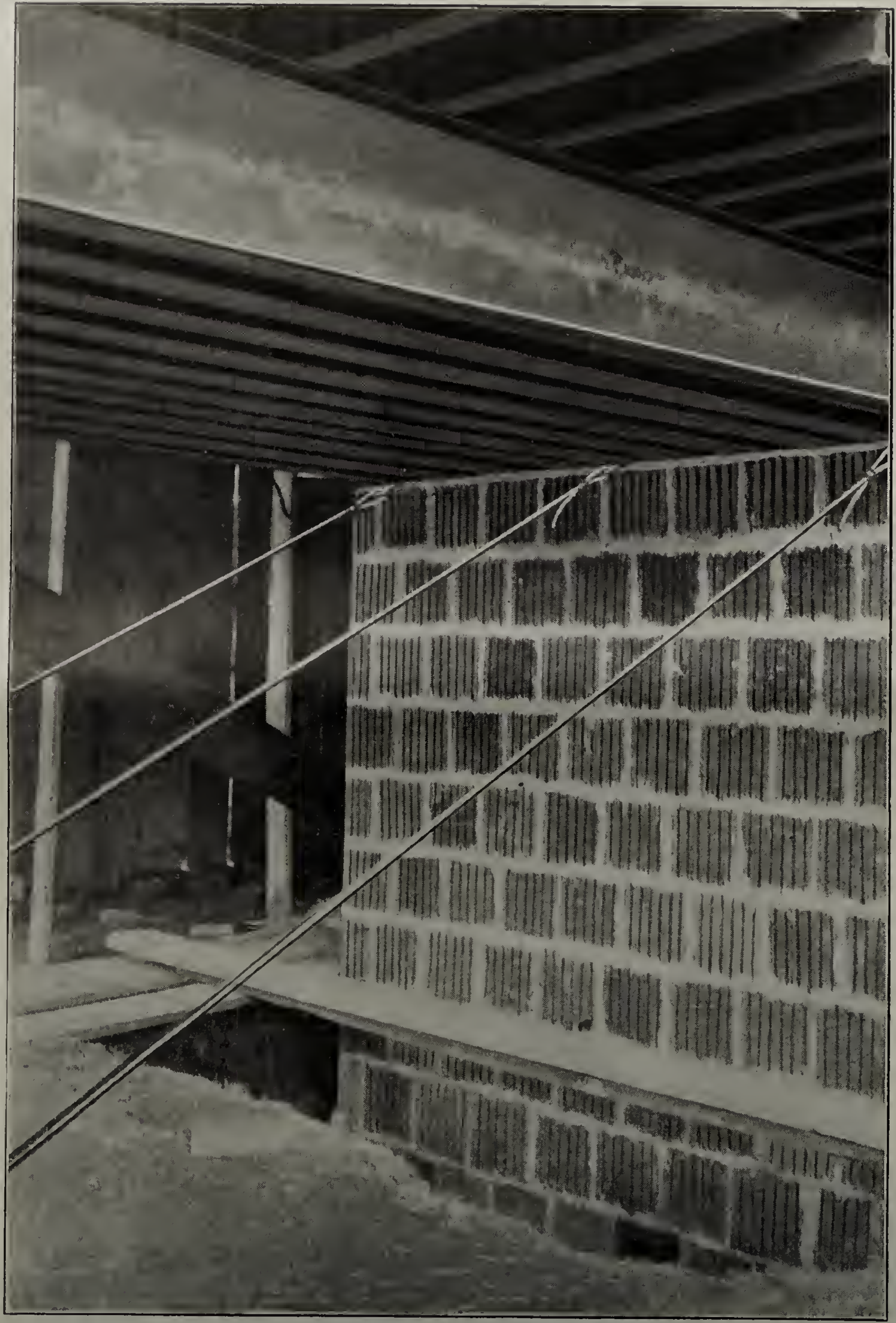


Photo 7—Plumb bob showing a leaning to the north, tension guys were put on.

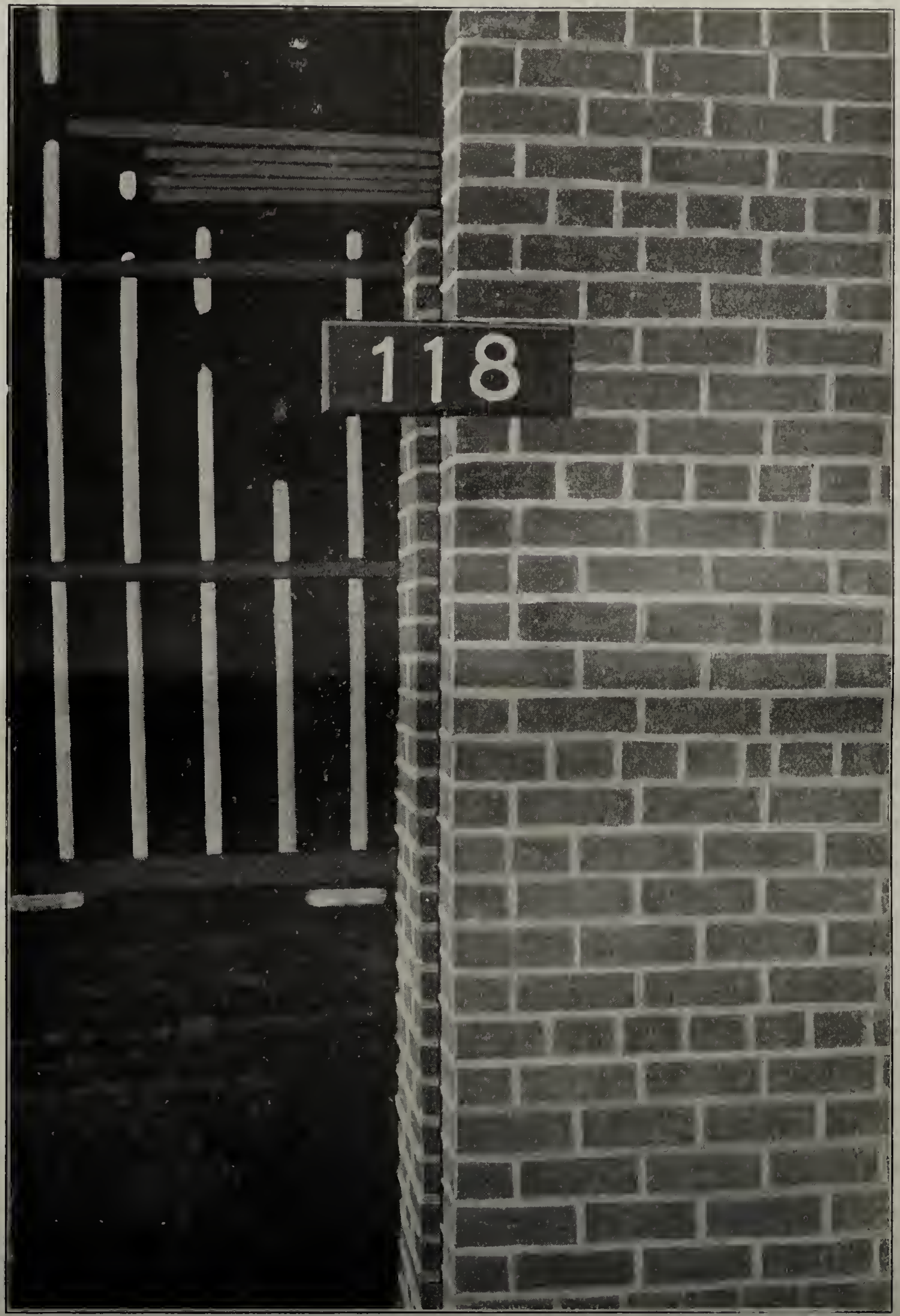


Photo 8—East end brick wall 118th load (equivalent to 384,125 pounds on each wall).

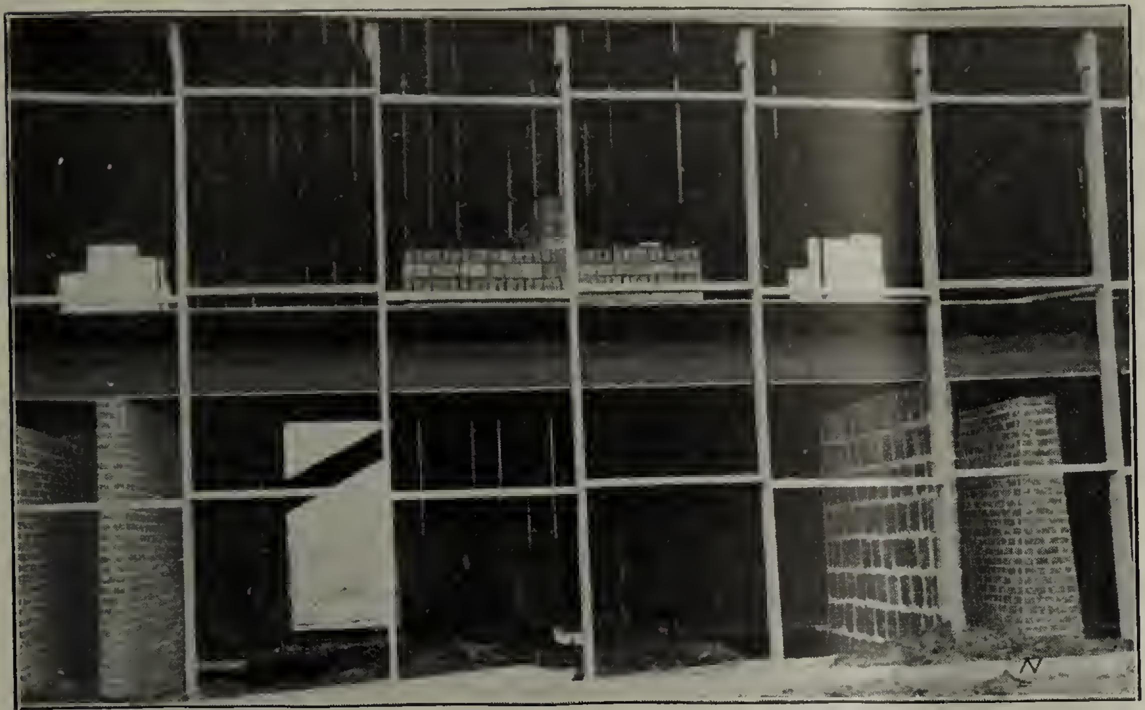


Photo 4—Part of siding taken off to show 40-ft. beams across the test walls. On April 12, 9 A. M., loading was commenced.

Photo 5—The loading platform was about 8-ft. 8-in. above the ground, making it necessary to hoist the brick from a wagon outside of the building to a man on an outside paltform just above the wagon, who in turn hoisted them to a man inside the building and on a platform level with the floor of the test load.

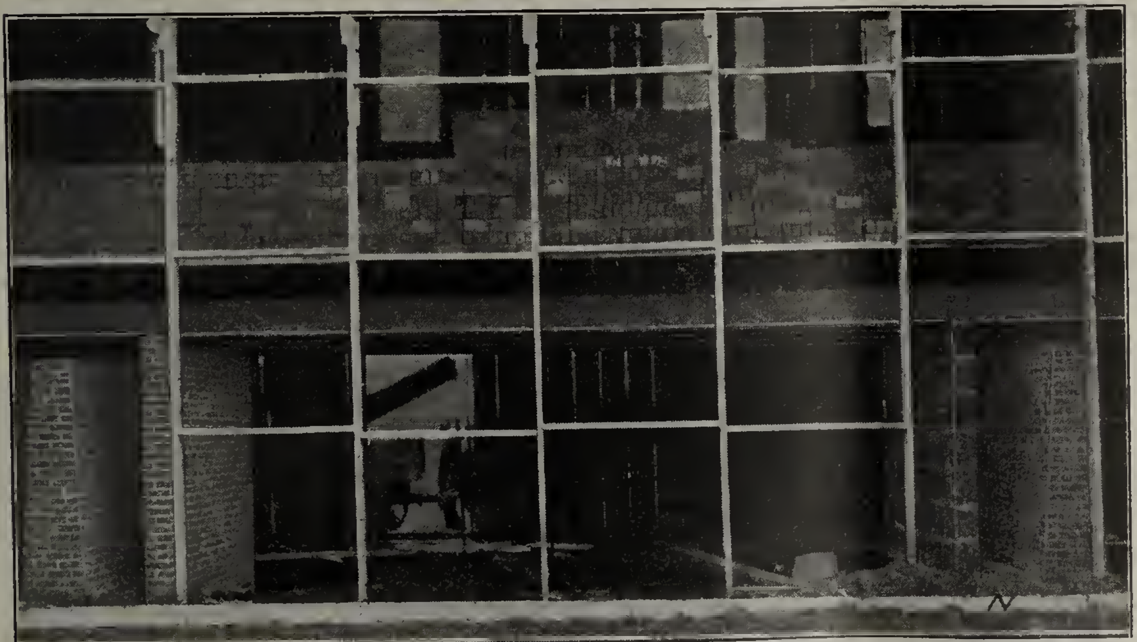


Photo 6—Result of 1½ days loading.

to hoist the brick from the wagon outside the building to a man on an outside platform just above the wagon, who in turn hoisted them to a man inside the building and on a platform level with the floor of the test load, from where they were passed on to the pilers.

On April 12, at 9 a. m., loading was commenced. See Photos 4 and 5. A center line between the walls was marked on the board floor and the first load of brick placed directly over the center line. From the center line the brick were piled outward in each direction to the ends of the platform by alternating the loads. Photo 6 shows result of one and a half days' piling.

Log of Test.

At the end of the first day's loading there were 40,775 pounds on each wall, with no indications of stress in either. At the end of the second day, with 102,775 pounds on each wall there was still no indication of distress.

About the middle of the afternoon of the third day, under a load of 185,675 pounds on each wall the plumb-bobs showed that both walls were leaning to the north or that the load was moving in the direction of the tile wall. Tension guys were put on immediately, being fastened to eye-bolts which had been placed in the concrete footings at the base of the brick wall. (There were bolts in the footings under the tile wall also.) Running from the foot of the brick wall to the top of the tile wall the guys formed a tie by which we pulled the walls both back into plumb. Shortly afterwards it was noticed that individual tile were developing vertical cracks, and that the tile wall had settled slightly. Thus, an explanation was found for the need of the guys on the tile wall, as follows: A slight settlement, due to the readjustment of stresses incident to the cracking of the tile, lowered the tile wall end of the load, which brought about a tendency for the entire weight to move toward the tile wall.

At 9 a. m., of the fourth day (April 15), audible cracking of the tile was noticeable from anywhere in the test shed. At this time each wall was supporting a load of 226,625 pounds. Shortly afterward the plumb-bobs showed both walls to be leaning northward ⅛ of an inch. By tightening the guys on the tile wall again both walls were brought back to plumb.

By the end of the following day each wall was sustaining 305,375 pounds. Cracks in the tile wall had lengthened slightly, while the brick wall presented no evidence of distress.

The following day, Saturday, April 16, the cracks on each end of the tile wall developed rapidly. While throughout the day the effect of the great stress was evidenced by slight cracking sounds in the tile wall, which culminated in a loud cracking and breaking of the west end of the tile wall.

Loading was continued Monday, April 19, with no apparent effect, until with 368,375 pounds a large piece of the east end of the tile wall broke out at the top. Loading was continued and pictures of both the tile and brick wall were taken just after the 118th load of brick (equivalent to 384,125 pounds on each wall) had been piled. See Photos 8 and 9.

At this time it was my opinion that something was due to happen and after conferring with Mr. J. S. Haggerty and Mr. Wm. B. Wreford, it was decided to lock the building for a week if necessary and await developments. Accordingly, at 4:30 Monday, April 19, with 390,425 pounds resting on each wall, the building was nailed up.

About fifteen minutes later, according to an employe working in the nearby boiler room, the building shook, hesitated, and swayed northward to the ground. See Photo 10. As will be noted the building was thrown violently to the north or in the general direction of the tile wall.

Resume.

1. First failure in test occurred in tile wall; vertical cracks appearing under a load of 185,675 pounds per 10′ of wall.
2. Actual breaking out of pieces of tile occurred under a load of 368,375 pounds per 10′ of wall.
3. Up to the time the test shed was locked there was neither audible nor visible signs of distress in the brick wall.

Respectfully submitted,
F. N. MENEFEE.

SECOND TEST.

F. N. MENEFEE
Assoc. Mem. Am. Soc. C. E.
Surveys, Concrete Design, Physical Test of Materials, Investigations and Reports on Water Power Sites.

Ann Arbor, Mich., Sept. 7, 1915.

Mr. Wm. B. Wreford, Manager,
Detroit Brick Manufacturers & Dealers Assn.,
Detroit, Michigan.

Dear Sir:

I beg to submit the following by way of report on the second of the tests on the comparative resistance common brick and hollow tile in wall construction.

Object of Test.

The object of this test was to discover the bearing value of 8″x12″x12″ tile laid on edge as compared with the

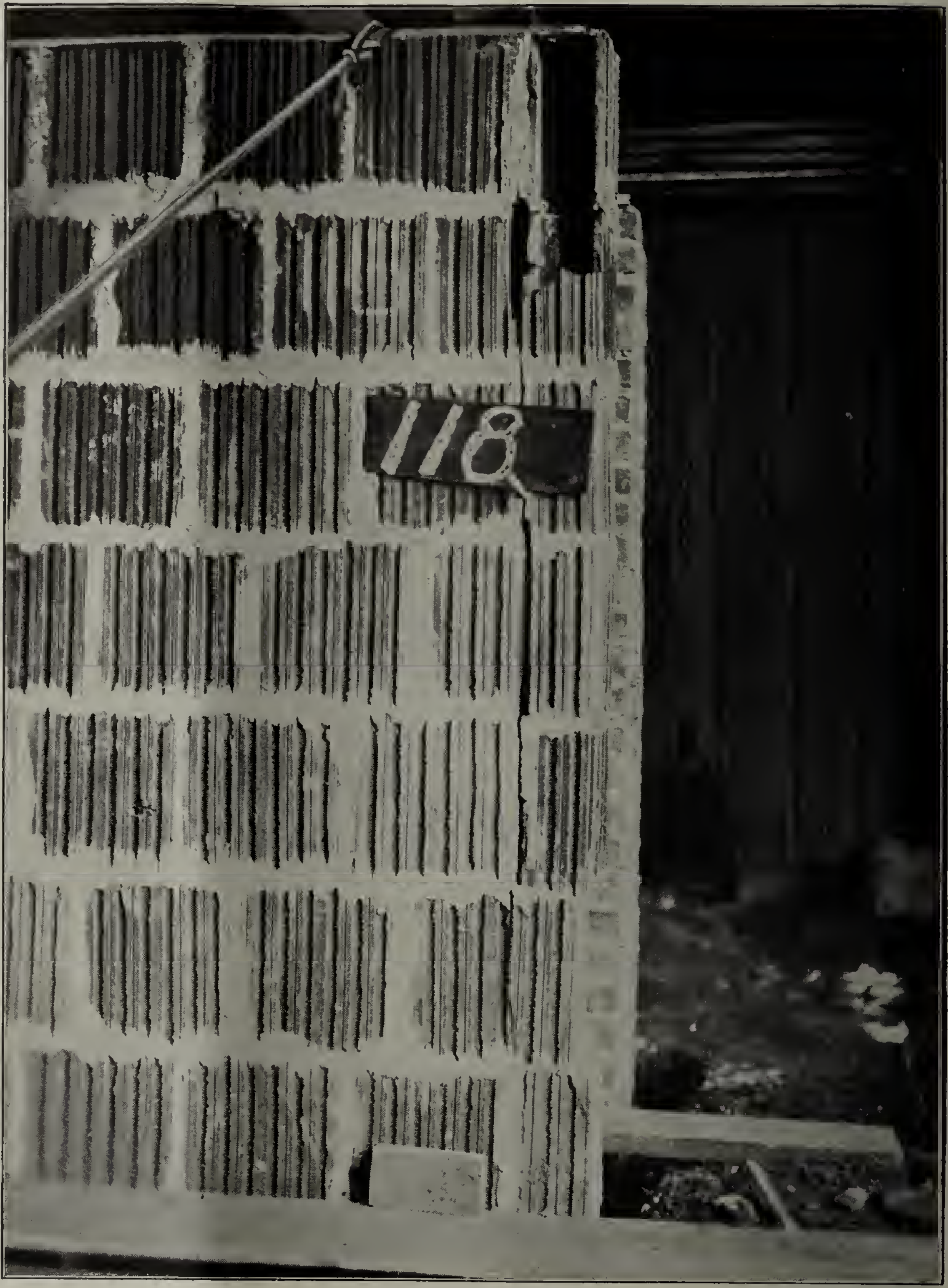


Photo 9—East end tile wall, taken at same time as photo 8.

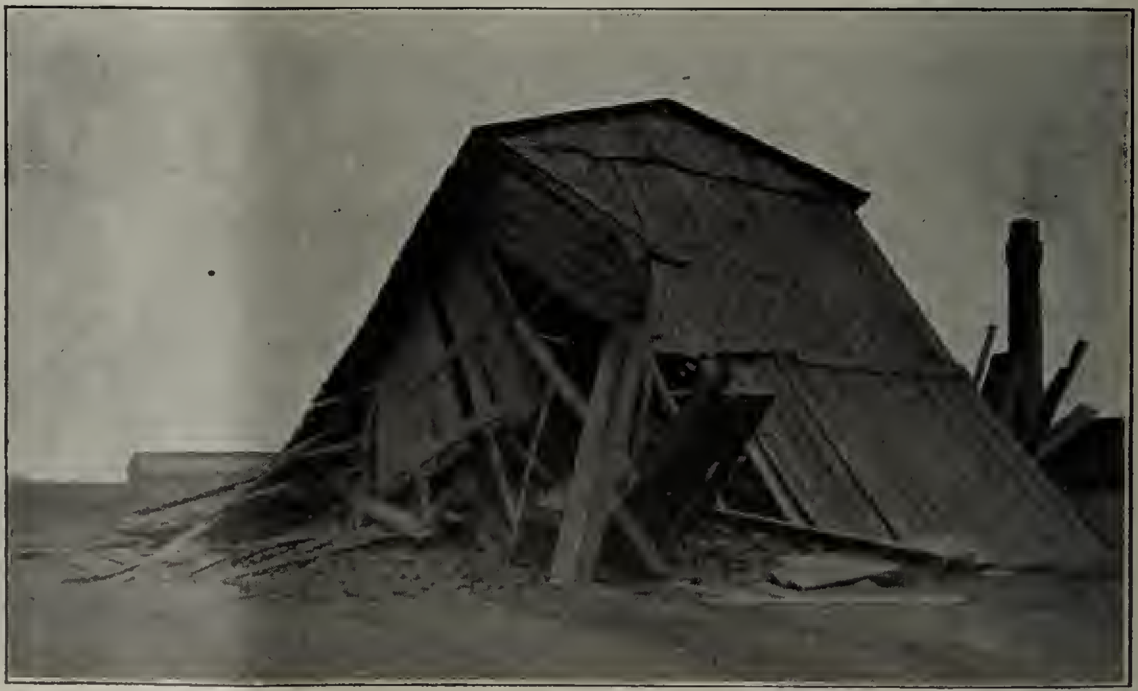


Photo 10—View of building from southwest.

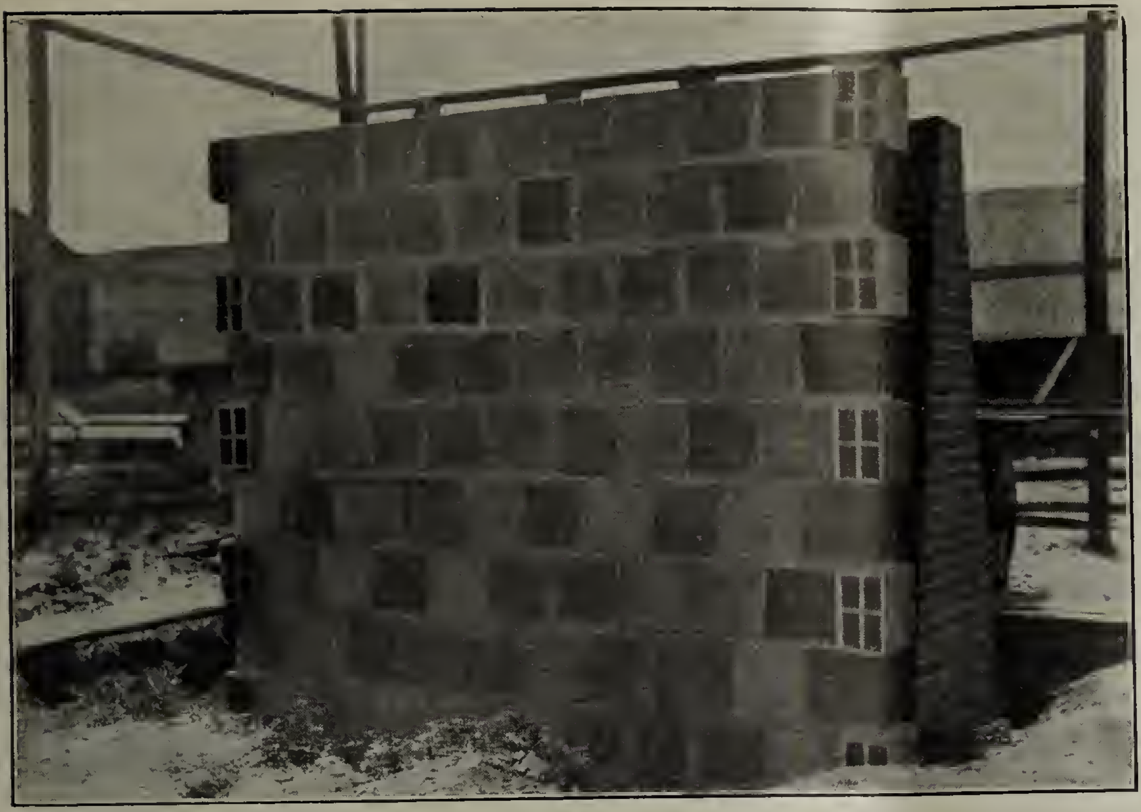


Exhibit No. 1—View of 10x10-ft. tile wall with safety wall behind it.

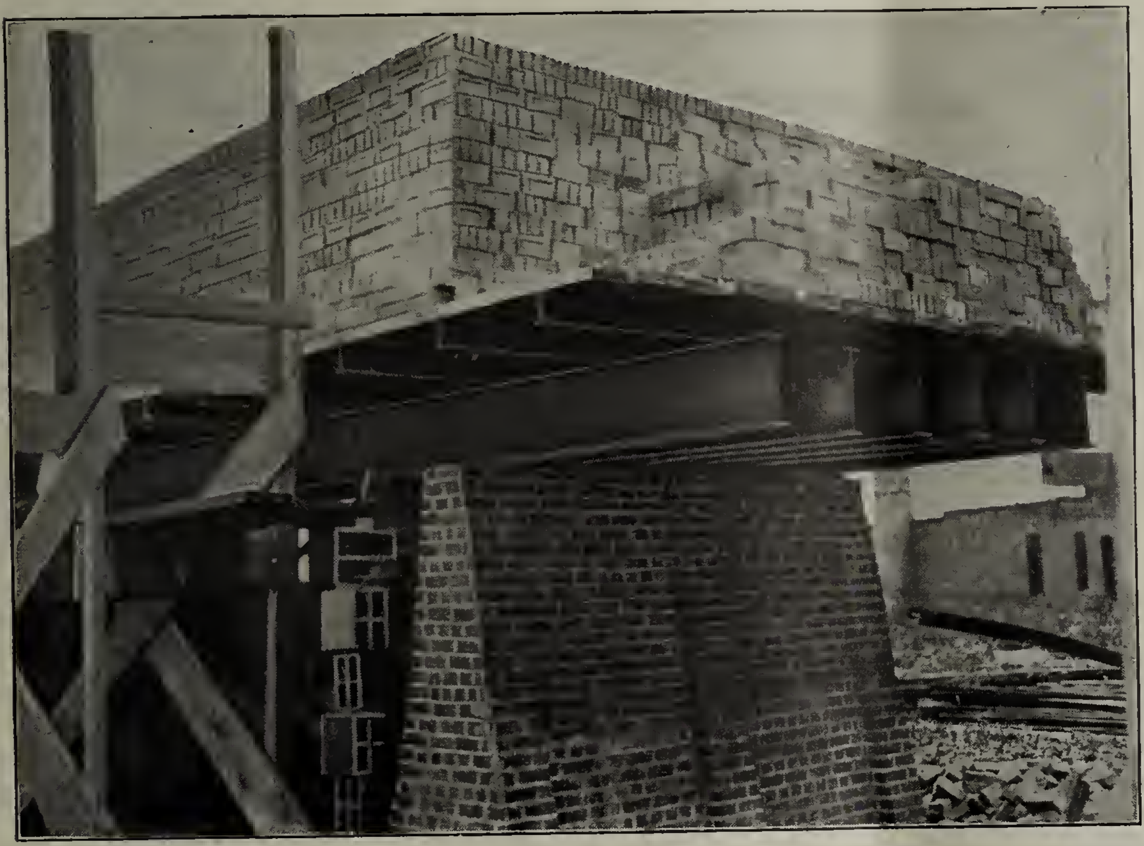


Exhibit No. 2—View of load causing failure, showing beams resting on safety wall.

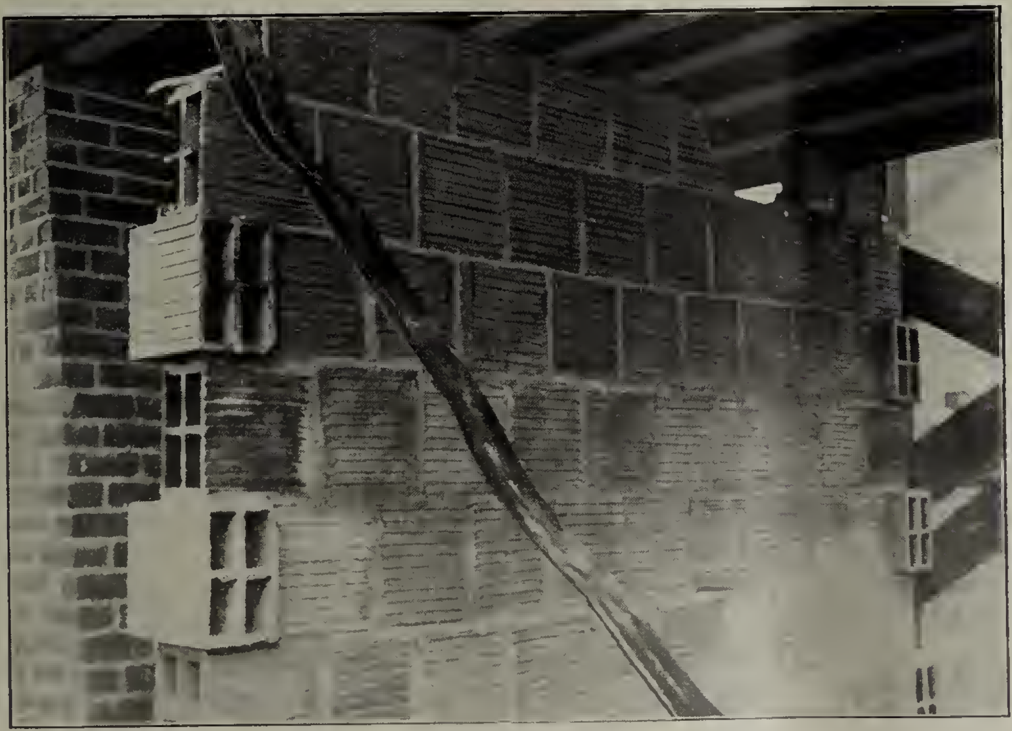


Exhibit No. 3—⅜x8-in. bearing plate after test.

value found in the test reported May 19, 1915, where the tile were laid on end.

Procedure.

The test was made on the site of the former test. The same footings were used. Inasmuch as the value of resistance of the tile wall laid on end was known from test No. 1 and as that value was less than the brick wall of same dimension, it was decided not to build a brick wall of the same dimensions as the tile wall to take one-half the load, but to build a very strong buttressed brick wall to take one-half the load and the tile wall to take the other with a safety wall behind it to catch the load when failure occurred. In this greater safety from swaying was assured while the amount of information gained was not reduced.

The tile wall was 10′ long and 10′ high, built of 8″x12″x12″, 4 cell type, weighing about 34½ pounds apiece, and were bought in the open market in Detroit. Exhibit 1 will give an idea of the care taken in selecting good tile for the wall and the method of laying them. The wall was completed July 17, 1915, by Mr. E. Dearing, a member of the Bricklayers, Masons and Plasterers Union of America.

I will give you the method of loading the 15″ 42-pound I-beams, each weighing 1,600 pounds. There were ten of these beams, supporting twenty-four 5″ I-beams, which in turn supported 2″ plank upon which the brick were piled. Exhibit No. 2 shows the wall end of this platform, which gave a loading surface of 15′x40′. As a bearing surface for the large I-beams, a ⅜″x8″x10′ steel plate was laid on top of the tile wall. This plate is shown as it appeared after failure, in Exhibit No. 3.

Log of Test.

Loading was commenced Monday morning, August 23, 1915. The brick were hauled by wagons. Beginning by placing load No. 1 3′ from the north edge of the platform, the loads were alternated between the north end and the south end till a load of ten brick high covered the platform and was symmetrically situated with respect to the supporting walls.

With twenty-six loads of brick on the platform, or a total (including I-beams) of 92,900 pounds on the tile wall, failure of two tile on the west end of the wall occurred. Visitors were within the enclosure at the time, but the fifteen seconds of audible cracking allowed them to get out of the enclosure. This failure merely let one of the large I-beams down on the safety wall.

At 3:45 Tuesday afternoon, August 24, with twenty-nine loads of brick, or a total of 102,350 pounds, the entire top tier of tile gave way, letting the load down on the safety wall, as shown in Exhibit No. 4.

This resistance averages 10,235 pounds per running foot of wall, as compared with 39,042 pounds with the tile on end, as shown by Test No. 1. While the tile used in Test No. 2 were not the same type as those in No. 1, they were made by the same company, were of same dimensions and weighed approximately the same. It is the writer's opinion, based on this and other tests, that tile on edge have a crushing strength of about one-fourth that on end. An interesting result of these two tests is that in both cases the average resistance to crushing of a single tile in a wall is about one-half the average value which will be obtained in a testing machine.

The exhibits herein will give a more detailed delineation of the exceptionally large scope of the test.

Respectfully submitted,
F. N. MENEFEE.

THE NATION'S BRICK STATISTICS.

A Brief Resume of the Report of the United States Geological Survey of the Clayworking Industries for the Year 1915.

THE VALUE OF the brick and tile products of the United States in 1915, according to the U. S. Geological Survey, Department of the Interior, was $125,794,844. Three varieties of brick and tile and miscellaneous products increased in value in 1915 compared with 1914. Front brick, valued at $9,535,536, increased $245,913, or nearly 3 per cent. over 1914; drain tile, valued at $8,879,264, increased $357,225, or 4 per cent.; fire brick, valued at $18,839,931, increased $2,412,384, or nearly 15 per cent.; and miscellaneous products, valued at $3,716,944, increased $551,130, or 17 per cent. There was a decrease of the total product of about 3 per cent.

The product that showed the greatest decline was sewer pipe. Common brick and terra cotta also showed decrease compared with 1914. The decrease in these industries occurred during the early months of the year, but the conditions improved during the last three or four months of the year, the year closing with bright prospects for 1916.

COMMON BRICK.

The principal clay product, considered as to value, is common brick, the value of which comprised one-third of that of all brick and tile products in 1915. The quantity reported for 1915 was 6,851,099,000 brick, valued at $42,145,292, a decrease of 295,472,000 brick in quantity and of $1,624,232 in value from 1914. The value price per thousand of common brick increased only 3 cents, or from $6.12 in 1914 to $6.15 in 1915. Illinois was the leading common brick producing State in 1915, reporting 1,066,057,000 brick, valued at $6,870,990. This was an increase of 124,714,000 brick in quantity and of $1,972,292 in value. Of Illinois' output 739,173,000 brick, valued at $4,794,452, or about 70 per cent. of the quantity and value of the State, was from Cook County. New York was the second, reporting 980,580,000 common brick, valued at $5,157,677 in 1915, an increase in quantity of 71,712,000 brick and $491,640 in value. The average per thousand in Illinois increased $125 and in New York 13 cents in 1915. Of New York's output, 741,568,000 brick, valued at $3,744,548, or 76 per cent. of the quantity and 73 per cent. of the value of the State total, was from the Hudson River region.

Common brick is made in every State of the Union and in the District of Columbia and in Porto Rico.

FIRE BRICK.

The second clay product in importance is fire brick, the output of which was valued at $18,839,931 in 1915, an increase of $2,412,384. The value of fire brick in 1915 comprised nearly 15 per cent of the value of all brick and tile products. Fire brick is used principally in the iron and steel and coke-making industries, and its production naturally rises and falls with the fluctuations in these industries.

The production of clay fire brick in 1915 was 833,739,000 9-inch equivalent brick, valued at $15,800,062, or $18.95 per thousand, an increase of 146,648,000 brick, or 21 per cent. over 1914, and $2,324,040 in value.

The leading State in the production of clay fire brick is Pennsylvania. This State reported for 1915 a production of 379,042,000 9-inch equivalent fire brick, valued at $7,177,629, or $18.94 per thousand. This was an increase in quantity of 80,859,000 brick and $1,402,952 in value. Pennsylvania produced nearly half the output of the country. Ohio was second in rank in 1915, reporting an output of 123,179,000 fire brick, valued at $1,996,792, or $16.21 per thousand, an increase in quantity of 20,444,000 brick and in value $163,052 over 1914. Missouri ranks third, producing in 1915 99,945,000 fire brick, valued at $1,922,736, or $19.24 per thousand, an increase of 23,768,000 brick in quantity and $368,307 in value over 1914. Kentucky and New Jersey ranked fourth and fifth, respectively.

The output of silica fire brick in 1915 was 130,244,000 9-inch equivalent brick, valued at $3,039,869, or $23.34 per thousand, an increase of 551,000 brick in quantity and $88,344 in value over 1914.

Pennsylvania is the leading State in the production of silica brick, reporting for 1915 92,348,000 brick, valued at $1,911,321, or $20.70 per thousand, a decrease of 3,988,000 brick and $150,505 from 1914.

If clay and silica brick be considered together, Pennsylvania was the leading State, reporting for 1915 a production of 471,390,000 9-inch equivalent fire brick, valued at $9,088,950, or $19.28 per thousand. This was an increase of 74,871,000 brick in quantity and $1,252,447 in value over 1914.

Production of fire brick was reported from 35 States in 1915.

VITRIFIED BRICK OR BLOCK.

Production of vitrified brick or block, valued at $12,230,899, or 9.72 per cent. of the value of all brick and tile products in 1915, was reported from 31 States. This was a decrease in value of $269,967 from 1914. The quantity of vitrified brick increased 22,011,000 brick over 1914, and the average price per thousand decreased from $13.42 in 1914 to $12.83 in 1915. Of this output 824,359,000 brick or block, or 86 per cent, valued at $11,114,427, or $13.48 per thousand, were sold for paving and 128,976,000 brick or block, valued at $1,116,472, or $8.66 per thousand, were sold for uses other than paving. Ohio was the leading State in the production and value of vitrified brick in 1915, reporting an output of 333,288,000 brick, valued at $4,017,758, or $12.05 per thousand, an increase in quantity of 39,907,000 brick, and in value of $335,528 over 1914. Ohio reported about 35 per cent. of the quantity and 33 per cent. of the value of the vitrified brick of the country in 1915. Illinois ranks second, reporting 142,689,000 vitrified brick or block, valued at $1,796,350, a decrease of 14,487,000 brick in quantity and of $289,994 in value from 1914. Pennsylvania ranks third.

SEWER PIPE.

Sewer pipe, fourth product in value, with an output worth $11,259,349, or nearly 9 per cent of the total, was made in 27 States in 1915. The leading States in the production of sewer pipe in 1915, named in the order of their importance were: Ohio, Missouri, Pennsylvania, California, Illinois, Georgia, Indiana and Iowa. Ohio's output was valued at $3,719,790 in 1915, a decrease of $971,929 from 1914. Missouri showed a decrease of $223,899 from $1,236,236 in 1914 to $1,012,337 in 1915. On the other hand, Pennsylvania showed a small increase of $63,529, or from $940,384 in 1914 to $1,003,913 in 1915. Pennsylvania was the only one of the leading States to show an increase in the value of sewer pipe in 1915. The decrease in the total value of sewer pipe in 1915, compared with 1914, was $2,755,418.

FRONT BRICK.

There were 855,668,000 front or face brick marketed in 1915, valued at $9,535,536, or 7.58 per cent of the total, an increase of 45,273,000 brick in quantity and of $245,913 in value. Front brick was reported from 42 States in 1915. Pennsylvania leads in production and value, reporting 244,781,000 brick, valued at $2,631,795, an increase of 24,858,000 brick in quantity and of $229,434 in value over 1914. Ohio ranked second, reporting 185,605,000 brick for 1915, valued at $1,925,096, a decrease in quantity of 2,469,000 brick and of $19,390 in value. Indiana ranked third in this product, reporting 83,610,000 brick, valued at $897,242, an increase over 1914 of 3,261,000 brick and $97,722. These three States combined produced about 60 per cent. of entire quantity and value of front brick in 1915.

DRAINTILE.

Draintile ranked sixth among the brick and tile products in value in 1915. The output was valued at $8,879,264, or 7.06 per cent. of the total in that year, an increase of $357,225 over 1914. The Middle West is the great producing region for this product (though it was reported from 36 States in 1915), Iowa, Ohio, Indiana, Illinois and Michigan reporting nearly 88 per cent. of the total in 1915. Iowa ranks first, reporting draintile to the value of $3,802,599 in 1915, an increase of $621,763 over 1914. Ohio was second, with $1,430,385 worth in 1915, a decrease of $159,180 from 1914. Indiana was third in 1915, with $1,253,805, a decrease of $78,197 from 1914.

FIREPROOFING.

Fireproofing, including hollow building tile, or block, ranked seventh among brick and tile products in value in 1915. It was reported to the value of $7,800,938, or 6.20 per cent. of the total, a decrease from 1914 of $584,399. Ohio is the leading State, reporting fireproofing to the value of $2,172,701, a decrease of $27,843 from 1914. New Jersey was second and Iowa third in 1915, New Jersey reporting $1,389,120, a decrease of $210,175 from 1914, and Iowa $1,008,457, a decrease of $74,940 from 1914.

Ohio.—In 1915 Ohio was the leading State in the production of brick and tile. The value of Ohio's brick and tile products in 1915 was $20,909,842, or 16.62 per cent. of the total, a decrease of $905,550 from 1914. Ohio's principal brick and tile products in 1915 were vitrified brick, valued at $4,017,758; sewer pipe, $3,719,790; common brick, $2,604,602, and tile not drain, $2,334,375. Ohio was the leading State in the production of vitrified brick or block, sewer pipe, fireproofing and tile, not drain.

Pennsylvania.—Pennsylvania ranked second among the States in the value of brick and tile products in 1915. The value of Pennsylvania's brick and tile products in 1915 was $20,898,282, or 16.61 per cent. of the total for the country, an increase of $797,787 over 1914. Pennsylvania's principal brick and tile product in 1915 was fire brick, which, including silica brick, was valued at $9,088,950, an increase of $1,252,447 over 1914. Its other large products in 1915 were common brick, valued at $4,515,296, front brick $2,631,795, and vitrified brick $1,638,518. Pennsylvania was the leading State in the production of front brick and fire brick.

Illinois.—Illinois ranked third among the States in the value of brick and tile products in 1915, as in 1914, reporting wares valued at $13,843,046, or 11 per cent. of the total. This was an increase of $1,304,672 over 1914. Illinois' principal brick and tile products in 1915 were common brick, valued at $6,870,990, vitrified brick $1,796,350, architectural terra cotta $1,289,848, and draintile $991,709. Illinois was the leading State in 1915 in the production of common brick. Illinois reported for 1915 every variety of brick and tile products as classified in this report.

New Jersey.—New Jersey was the fourth State in the production of brick and tile products in 1915. Its wares in 1915 were valued at $7,916,080, or 6.29 per cent. of the total. This was a decrease of $437,216 from 1914. New Jersey's principal brick and tile products in 1915 were: Common brick, valued at $2,099,654, achitectural terra cotta $1,430,968, fireproofing $1,389,120, and tile, not drain, $995,097. New Jersey is the leading State in the production of enameled brick and terra cotta.

New York.—New York was the fifth State in rank in the value of brick and tile products in 1915, reporting wares valued at $7,047,262, or 5.60 per cent. of the total, an increase of $124,121 over 1914. Common brick was New York's chief clay product and was valued at $5,157,677 in 1915, an increase of $491,640 over 1914, and terra cotta (valued at $647,816 in 1915) was its second.

Value of Brick and Tile Products in 1915.

	Value.	Percentage of total.
Common brick	$42,145,292	33.50
Vitrified brick or block	12,230,899	9.72
Front brick	9,535,536	7.58
Fancy or ornamental brick	109,425	.09
Enameled brick	835,808	.66
Draintile	8,879,264	7.06
Sewer Pipe	11,259,349	8.95
Architectural terra cotta	4,796,062	3.81
Fireproofing	7,800,938	6.20
Tile, not drain	5,186,055	4.12
Stove lining	459,341	.37
Fire brick	18,839,931	14.98
Miscellaneous	3,716,944	2.96
	$125,794,844	100.00

BOOK OF SMILES FOR AUGUST.

The up-to-dateness of the Book of Smiles is evidenced by the first item of the current issue, which reads:

> "Whiskers in the White House might prove ticklish to General Carranza."

Another timely paragraph is the following:

> "WHAT PUZZLED RILEY." Meredith Nicholson, the novelist, relates that some years ago James Whitcomb Riley visited the Tippecanoe battlefield. The antiquarian shark who showed him around insisted on going into all details and the poet, as a result, became rather worn down by the effort of the tramping over every inch of the three-acre tract to the accompaniment of an endless flow of enthusiastic description. Finally the end was reached. They had arrived at the seven-foot ornamental iron fence that encloses the field. "Now, my dear Mr. Riley," said the long-winded guide, "is there anything regarding this hallowed place that you do not understand?" "Yes," replied Riley. "How the hell did the Indians jump the fence?"

Under the head, "Our Clay is Different," there is a serious remark of interest to clayworkers. We quote:

> "OUR CLAY IS DIFFERENT": Just so. But note this: Absolute control of the drying elements makes the Standard Drying System adaptable for drying the most difficult clays successfully. We have demonstrated this time and again to the satisfaction of other brick manufacturers with "different" clays to contend against. We will do the same for you, if you say the word. Remember: Heat, humidity and circulation of air in the Standard Dryer are everlastingly under the operator's control. Full information in our catalog sent on request.

For other good reasons why you should use the Standard Drying System, write the Standard Dry Kiln Co., Indianapolis.

BLASTING DOWN SHALE AND PLASTIC CLAY.

(Continued from the May Clay-Worker.)

MOST GOOD shales are too hard to permit easy digging, and blasting is essential to success. The methods of blasting and the explosive used will depend on the nature of the shale and the height of the face.

Usually, for shallow faces and flat stratification, the best practice is to punch vertical holes from the top of the bench. These should be spaced back from the face a distance slightly greater than the depth of cut for work up to 7 feet deep and apart an equal distance. For deeper work the spacing can be increased. A rough basis for estimating the spacing, back and apart, for holes on faces from 14 to 20 feet high, is one-half foot for each foot of height.

Fig. 12. The Shale From This Pit is Thoroughly Mixed. Blasting Instead of Picking Would Give Better Mixing and a Lower Cost for Digging.

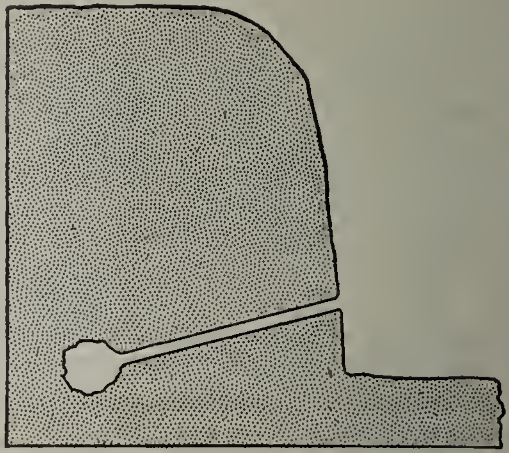


Fig. 13. Location of a Horizontal Hole for Blasting Down Shale or Clay.

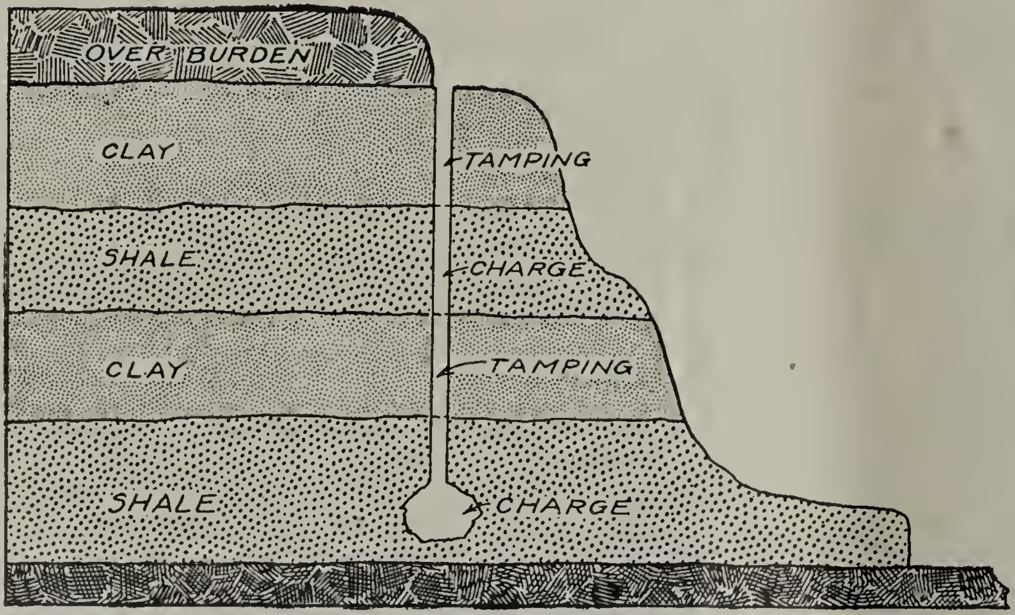


Fig. 15. Diagram of the Loading Described in Cut Showing Location of Hole and Charge.

Fig. 14. Drilling the Hole Shown in Fig. 13.

The holes should be drilled well below the level of the pit floor to prevent the danger of the shot blowing out at the bottom, and to insure more of a heaving action so that the material shot down will be more thoroughly mixed. Red Cross Extra dynamite 20 per cent. to 40 per cent. strength is recommended.

For some shales, especially those having a decided dip, better results are obtained by horizontal holes made into the face near the level of the floor. When the nature of the shale will permit, such holes can usually be sprung to good advantage. This will permit the placing of the charge at the back end of the hole, where the hardest work is to be done. The location of such a bore hole is indicated in figure 13.

The bore holes for blasting shale can be made with an ordinary drill, or if the shale is soft enough, with a punch or churn drill, or with a special auger, using a little water in the hole.

When a the face is 25 feet, or higher, the use of larger bore holes is desirable to permit better distribution of the charge; reduce the cost of drilling and loading; and overcome the necessity of springing. For making such holes a blast hole drill, often called well-drill, is used. Such a drill should have a 4 or 4½-inch bit. Reports on different blasts will give a better idea of the effectiveness of this kind of loading.

A.—Hard shale, face 50 feet, 4½-inch holes, spaced back 15 feet, and 20 feet apart. Loaded with Red Cross Extra 40 per cent. dynamite and several holes fired together. The holes were tightly tamped for about 15 to 20 feet. Material brought down economically and in good condition and well mixed.

B.—Hard shale, 100-foot space, 4½-inch holes, spaced 20 x 20 feet. Loaded with Red Cross Extra 40 per cent. dynamite. Material well broken and mixed.

C.—Alternate strata of hard shale and softer clay. It was desirable to mix all material thoroughly. The former practice was to shoot in benches and mix material as it was loaded into the cars. The face was 60 feet, and sloped badly, giving a burden of 12 feet at the top and about 25 feet at the toe. This, together with the loading, is represented in figure 15.

A blast hole drill was used. The hole was sprung at the bottom and loaded with blasting powder, using a Red Cross Extra 40 per cent. dynamite primer in each section of the load. The shot "toed-out" well at the bottom. The material was thoroughly mixed and broken. The cost was reduced.

The practical application of these methods to an individual pit may demand some variations from the cases cited. The shales are usually dry and either blasting powder, low powder, or Extra grades of dynamite can be used without fear of damage from water. Should the bottoms of the holes be wet, Red Cross Gelatin of the same strength of the dynamite recommended should be used.

The method of blasting ordinary plastic clays for making tile and common brick will depend on the height of the face, the method of digging, the hardness of the clay, and on the nature of the floor. The recommendations made for shooting for stripping apply equally well for loosening clays where they are brought out over the floor of the pit.

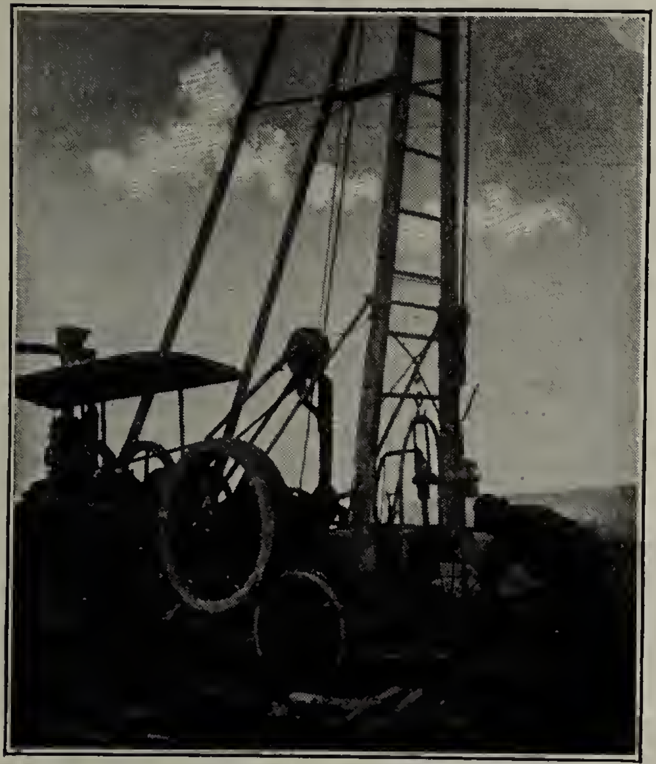


Fig. 17. Starting Bore Hole With an Auger Before Using the Well-Drill Machine.

Fig. 16. Well Drill at Work Making Blast Holes in a Hard Shale Pit

Fig. 19. The Loose Stone Seen Along the Track Was All Shaken Loose From the Clay by Blasting.

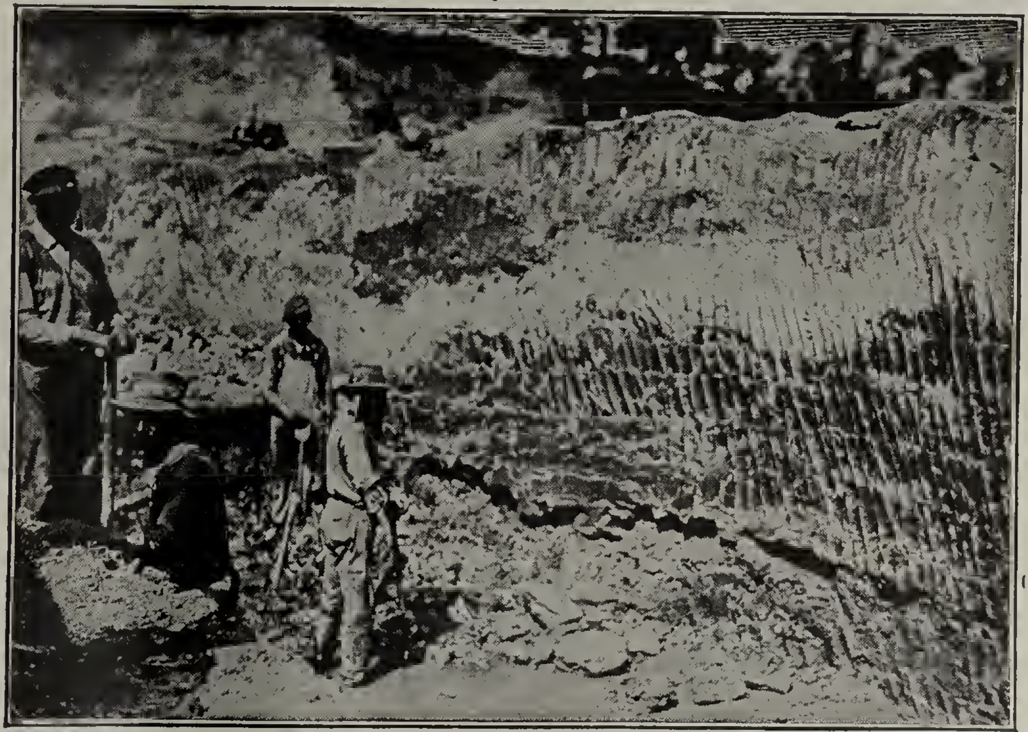


Fig. 18. The Clay in This Pit Differs in Top and Bottom Strata and Must Be Mixed. This Could Most Easily Be Done By Blasting.

In developing this type of blasting several unexpected results have been obtained. Some pits were having much trouble in mixing the top and bottom strata and were losing trade thereby. Blasting down the face resulted not only in decreasing the cost of digging, but gave a better mixture of the clay than had been possible by the former methods. Hand digging had been followed.

In other pits the trouble was from loose boulders that seriously retarded the work. Blasting not only loosened the hard clay, but materially assisted in getting out the boulders, and sending the clay to the plant in better shape.

Much good can be done in tempering some clays by blasting the impacted pits, when in a dry condition, well in advance of the need. This permits the absorption of much rain, lets the frost in deeper, and begins the processes of tempering that are later finished in the mixer or pug.

Much clay is found over quicksand or other soft ground where difficulty is experienced in the upkeep of tracks for cars or of roads for carts. Digging from above will largely overcome these troubles as the cars or carts can then be handled on the surface instead of in the bottom of the pit. This substiution is made possible by drag-line or similar excavating rigs that work from above. When the clay is wet or soft, there is no difficulty in filling the buckets and working to full capacity. When the ground is hardened by drying out or freezing, it should be loosened with blasts such as have been described for stripping. Practical pit trials have proven the advantages of this method of digging.

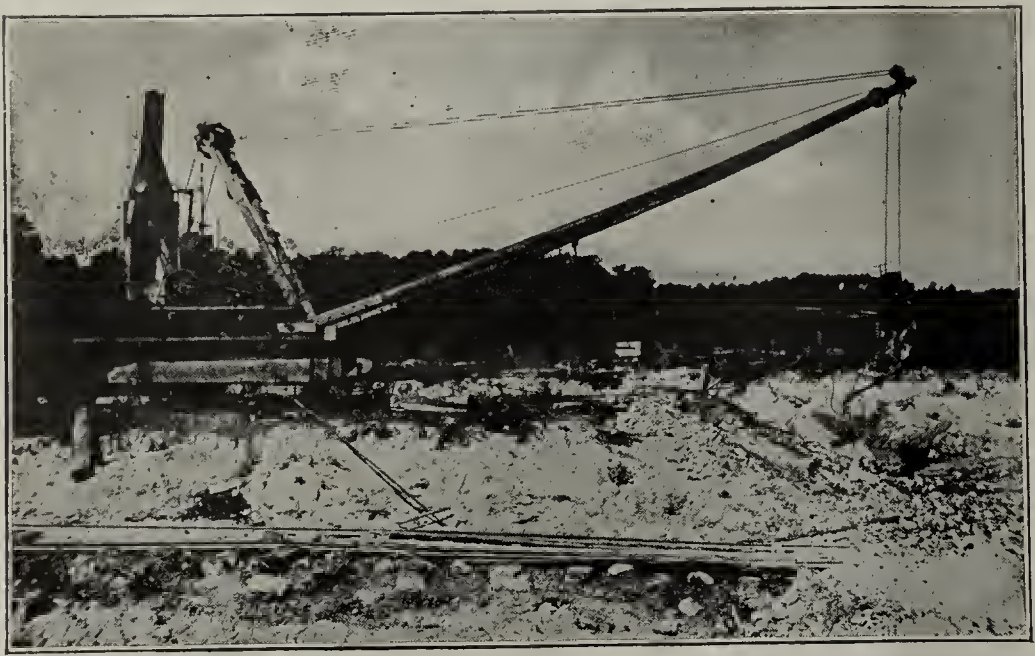


Fig. 20. Where a Drag-Line Machine and Blasting Are Overcoming the Troubles From Hand Digging and Derailed Cars and Broken Locomotives in the Bottom of a Pit Troubled With Quicksand.

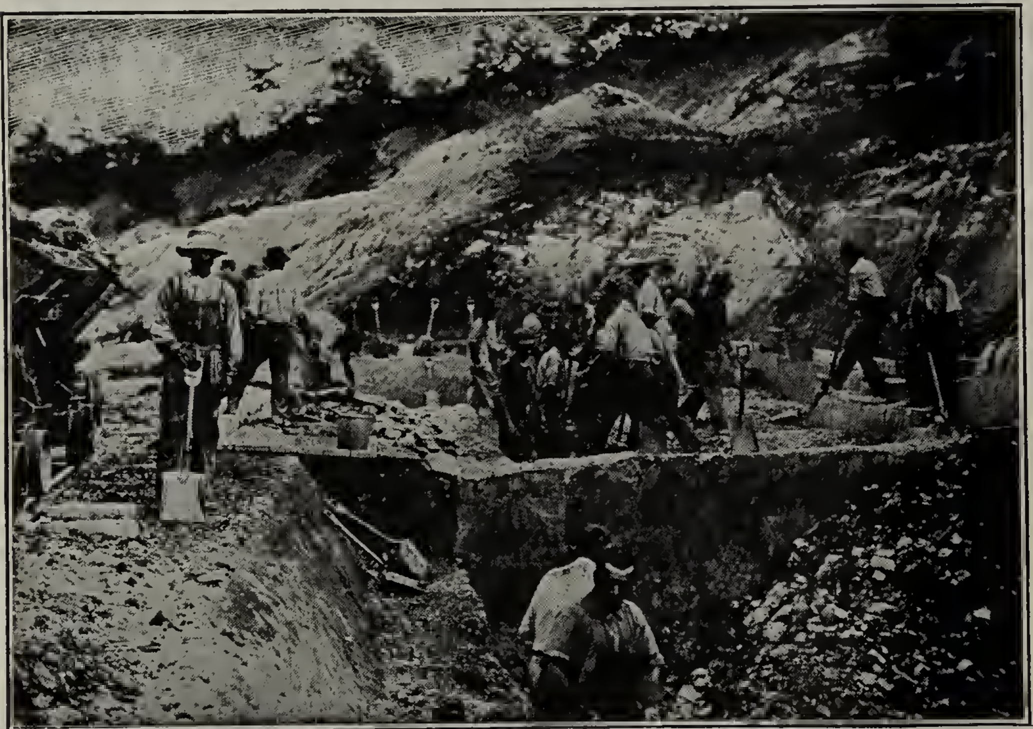


Fig. 21. A Soft Clay Pit When All the Clay is Blasted.

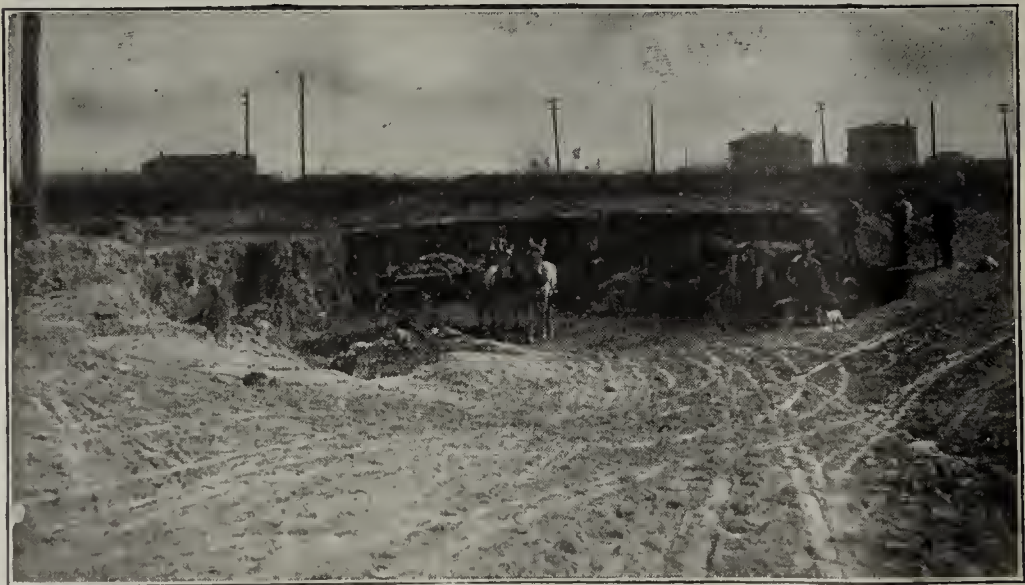


Fig. 22. Digging Clay From Vertical Pits. Explosives Can Be Used to Good Advantage to Start the Work When the Clay is Hard or Frozen.

Many clay pits are troubled with quicksand below the clay as is shown in figure 20. In many of these where the car tracks are placed in the bottom of the pits, it is very difficult to keep up the tracks, and serious delays are caused by the loaded cars being derailed. Usually in these pits hand digging is employed. The substitution of a drag-line outfit and blasting permits the placing of the tracks on higher ground. This overcomes the hauling troubles and reduces the cost of excavation as well as the cost of upkeep of track, cars and locomotive. Even where the bottom is solid and is not troubled with standing water this method is proving satisfactory. Where the drainage conditions are bad it is to be highly recommended.

Figure 18 shows a clay bank where the top and bottom strata are decidedly different and must be thoroughly mixed. When frozen or dried hard this bank should be shot down by blasts so as to reduce the cost of shoveling. If blasted, a drag-line or steam shovel could be used to replace the hand labor.

Some high-grade clays are troubled with hard pebbles and must be spaded thin to expose the pebbles so that they can be picked out by hand. When this is necessary blasting should not be practiced unless the clay is dry or frozen and the cut cannot be begun. Such trouble can be expected in pits worked like the one represented in figure 22. To start the work put down two or more shallow holes spaced 30 to 40 inches apart, load each with from one to two cartridges of 30 per cent. to 60 per cent. Red Cross Extra dynamite, primed electrically, and fire all together. This will open up a short trench and expose ample room for the shovelers. (To be continued.)

MANUFACTURERS' INTEREST IN A RAILROAD STRIKE.

Any strike is an economic loss. No point gained by either side can ever compensate those who have suffered thereby. A general railroad strike would be an economic disaster. If it should come about it will be because of the indifference of the business man and manufacturing world, to their own welfare and to that of the country in general.

The railroads have been asked to grant a wage preferment of one hundred million dollars. This sudden expansion of the pay-roll cannot be met from thin air. It must be provided for by additional taxes to be levied on the traveling or freight-shipping public and, as the Interstate Commerce Commission fixes the rates the roads may charge, this question properly comes within its jurisdiction as arbitrators. It is but logical that, being the arbitrary judges of rates, they should also be the arbitrary judges of what a railroad may pay out in wages because that must affect the rate and must be taken into consideration.

No one in the whole country is so vitally interested as the manufacturer, as any raise in rates operates as an additional cost of manufacture. The manufacture of merchandise is so closely related to the delivery of it to the consuming public that the interests of the common carrier and manufacturer cannot be divided.

Therefore, the impending strike is of paramount importance to every industry in the country. There is sure to be a great struggle, and if the railroad unions do not climb down from their position of refusing to arbitrate, it is going to be a most disastrous blow to reviving industries, only recently saved from practical annihilation by a fortuitous war in Europe.—Pierre N. Beringer in American Industries for July.

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give a paper read at the 1915 convention of the American Ceramic Society.

INDUSTRIAL CO-OPERATION IN CERAMICS AT THE IOWA STATE COLLEGE.*

By Amos P. Potts.

AT THE STATE COLLEGE, at Ames, Iowa, we have had, for the last five or six years, a ceramic course. I gave you a little talk about it last year, and mentioned that the students were a scarce article. Well, we have come to consider that a blessing, for last year the largest manufacturer of clay products in the state requested us to send one or more men to his factory, so as to go over the methods of manufacture in detail, and tell how to improve the quality of the product and cut down its cost. Not having any students, I went, and the experience has been of immense value to me, and of some value, I hope, to them. In fact, the rumors that have come to me have been quite complimentary.

Now this has opened up a new line of work, to my notion, and we have been seriously considering the proposition of making it a principal function of our department at Ames. To go out and educate the manufacturers and improve their methods of manufacture and improve their product, rather than sit in our offices and wait for them to send their friends or their sons to us to be educated. Five or ten years hence, this will produce the same results. Indeed, I think that they will all admit that, for quick results, the method of industrial co-operation is the method to use.

When you come to consider the cost, you may think that it is prohibitive; but we turned out a graduate last year who cost the state something like $2,500 for his senior year's education; and this year we are educating at least four superintendents, one general superintendent, and as many men as we can come in contact with through talks, or conversation, as we can get it, at considerably less expense to the state. The concerns that are having the work done are paying the cost of the work. The college or the state is paying the salary of the man on the job; so that, actually, it is not an expensive method of educating the clayworkers of the State of Iowa—that is, from the standpoint of the state at large. The manufacturer gets what he pays for. The state is spreading the information that is desirable; so that, from that point of view, we consider that it is a successful move and an advisable one.

We have made many mistakes, but who does not, when starting out on a comparatively new line of attack. We hope, eventually, to get the matter standardized, so that we can do the work at considerably less cost to the state; by being able to take on more than four or five factories in a year, and by being able to cut down the time necessary for these investigations. At the same time, we will cut down the cost to the manufacturer to have the work done, by cutting down the time and, hence, cutting down the amount that he shall pay so that, in time—and it will not take so many years, at the rate at which we have been going—our work will be of the same grade of efficiency that we are trying to instill into the manufacturer regarding his work, and its cost not at all prohibitive to him or to the state.

There are two complications that may arise—one, in particular. Suppose that some man trained in this work should enter the state and establish an office as a consulting engineer? We should then be competing with him on a basis that he could not meet at all. If that situation should arise, we shall have to adopt another method of handling the work. We might charge the manufacturer the man's salary, as well as his expenses, so as not to compete with an engineer who should come in to do business in a consulting capacity; but until that condition arises, we feel justified in going ahead as in the past.

Another condition that might arise is that if we get students, we shall have to stay and teach them, and not go out; but that difficulty can be met by employing enough assistants to carry on the work.

To give an idea of the work that we have done, I would say, in the first place, that we went at it in the wrong way. We undertook to go over the whole proposition at once, and then write up a report at the end of our investigation, telling what we had found, and making recommendations for improvement. From a scholastic standpoint that is all right, but from a practical one, it is all wrong. When we have to it over—and, in fact, now—we will go at one particular phase of the subject at a time. In taking a general survey, if the trouble seems to be with burning, we will take up the question of the burning, get that systematized correctly, and report on it; getting our report to the company quickly, so that they can fix this trouble and not get discouraged from waiting so long to carry it out. Whatever the trouble is, we shall attack one problem at a time and settle it, and then go on to the next one. That is the plan that we are to work on in the future; and if any of you have such a proposition come up, I advise you against trying to do the whole thing at once. It will prove discouraging. You get a great mass of data, and it is hopeless to try to write up a satisfactory report. The company gets tired waiting for it; and when it does come, it is more or less stale; because they may have talked the matter over; and by the time the report comes along, most of the errors have been corrected, and the report is not of very much value.

I have outlined the movement and explained, in a general way, the method of operation.

Discussion.

Prof. Orton: I want to ask a question. Do I understand that you now tax the firms for whom you work with a proportionate share of your expenses?

Mr. Potts: All my expenses are paid by them; and my salary is paid by the state, just as if I were teaching in the classroom. The firm pays my expenses when away from the college.

Prof. Orton: Then, in effect, the state is furnishing a high quality of expert service for the benefit of the individual manufacturer?

Mr. Potts: Yes; but we have the privilege of publishing all the results that we obtain. Any information that we obtain, we can publish for the benefit of the state.

Prof. Orton: I am greatly interested in this paper of Mr. Potts'. I saw him two or three weeks ago, and, in a hasty conversation with him, I learned enough of the plan to know that it would be of interest here. I should think that the situation disclosed in Iowa would be difficult to adapt to states that are not so far west. These western communities have a much more plastic frame of mind on all such questions as the relation of the university to manufacturers, and everything of that sort, than have those in the more eastern states; and they are more willing to try experiments and adopt new notions. If we were to try in Ohio, for instance, the plan of sending instructors from the university to advise each plant as to its particular difficulty, and keep men there for any length of time, there would shortly, I fear, be a big outcry raised in the legislature against what they would call paternalism. I am not stating that I think it is improper for the state to do this, but merely that it would be difficult to get the public in the eastern part of the country, where the communities have become pretty settled and mature in their ways, to see that this should be done. It is easier to do it in the West, where they are younger and still willing to try any experiment in governmental method that comes along.

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*Reprint from Transactions of the American Ceramic Society, Volume XVI.

Mr. Joseph Keele: I just want to add a word of appreciation of the work that Mr. Potts has been doing in Iowa, and I think that in many instances it could be applied to the problems in Canada, where some kind of supervision seems warranted. Then, as to what Professor Orton has said about the conditions in the eastern states, I think that we should have no such difficulty in the eastern provinces of Canada. They would be glad for any assistance that the government ordered, provincial or federal, for the company. For instance, in the Province of Quebec, we wanted to emphasize the necessity for the production of drain tile. There is not one, at present, made in the province; and we shall sooner or later have to have some one, under either federal or provincial auspices, to educate the people in making them, after they have been taught the necessity of using them. I am much interested in the work of Mr. Potts in Iowa, and glad that a movement in this direction has been made in other communities.

Charles M. Crook at the Factory Office.

Mr. Potts: In discussing this proposition of state aid to manufacturers, I might bring up the fact that the people of Iowa and of other western states with whom I have talked feel that the university belongs to them and ought to be doing something for them. Because they take this attitude, we are permitted to do this work. They are voting money and paying taxes, and they want some return. The Agricultural College has been doing such work for years, beside sending out trains and holding institutes all over the state.

THE BINGHAMTON BRICK COMPANY, INC.

Chas. M. Crook Becomes a Resident of the Parlor City.

THE GOOD PEOPLE of Binghamton, N. Y., one of the thriftiest of the lesser cities of the Empire State, are rejoicing over the rehabilitation of the excellent brick plant which in years past has furnished a fine grade of building brick and a superior quality of pavers for that locality. The plant was closed down last season and has recently been purchased by George E. Prindible and a few intimates who, being experienced clayworkers, will make the plant and its products a credit to the community. The Binghamton Brick Company, incorporated, has elected the following official family: George E. Prindible, president; C. F. Crook, vice-president; R. L. Winslow, secretary, and Charles M. Crook, treasurer. The latter will have the actual management of the plant. He has become a resident of Binghamton, well named the "Parlor City," for it is a very tidy commonwealth of 50,000 souls. Brick predominates as a building material, particularly in the business section, where there are a number of imposing structures, the latest and most beautiful of which is the High School, built of dark red brick with stone trim. Many of the streets are paved with brick, and in time it is hoped to make it an exclusively brick-paved city.

Stock Piles and Kilns of Binghamton Brick Co., Inc.

The property includes many acres of fine, hard shale, which is taken from a hillside above the plant. It is handled on a down grade to the factory, where it is first passed through a gyratory crusher and then goes to dry pans, of which there are three. The machinery equipment was furnished by E. M. Freese & Co., Galion, Ohio, and is in every way adequate for a daily capacity of 50,000 pavers. For a time the plant will be devoted almost exclusively to building brick, which are dried in tunnel dryers and burned in square down draft kilns. This part of the work will be done under the direction of Luke M. Johnson, a practical brick burner of many years' experience. Mr. Crook has experienced much difficulty in getting labor, but hopes to have the plant in full operation very soon. He is still interested in the plant at Catskill, with which he has been connected for a number of years, but expects to devote most of his time to the Binghamton factory, where he will be more than pleased to welcome any of his many friends who may pass that way.

PAVING BRICK CONFERENCE TO BE HELD AT TERRE HAUTE IN OCTOBER.

The National Paving Brick Manufacturers' Association expects to conduct a study and conference in brick pavement construction during the first week of October in the vicinity of Paris, Ill., making the headquarters of the occasion at Terre Haute, Ind.

All persons connected in any way officially, or those deeply interested in the roads of this country, will be made welcome at this conference. It is undertaken no less in behalf of the brick industry than in the sincere belief that the country itself is bound to be profited by such an opportunity.

Engineers whose deep interest in the study and inquiry into the economy of monolithic construction will be pleased with this announcement. The money expenditure for roads is so great that a deep interest as to their economic value is manifest everywhere by chambers of commerce and automobile clubs. This occasion will afford bodies of this character an opportunity to make a careful investigation, and examination into the merits of this kind of road that cannot be gained in an ordinary inspection trip.

Luke M. Johnson in Charge of the Drying and Burning.

The conference will be characterized by a critical study of what may be seen in every phase of the construction and the finished pavement.

COMPARATIVE STATEMENT OF BUILDING OPERATIONS FOR JULY.

The feature of the statement of building permits issued in the principal cities throughout the country for the month of July is the tremendous gains in Manhattan borough, New York City, the total reaching $49,205,220, as compared with $4,845,303 for July, 1915. This increase of nearly one thousand per cent has a special explanation. It was due to the adoption of a building regulation plan by the board of estimates of the city, effective July 25. By that plant the height of buildings is restricted. To escape the restrictions, prospective builders of skyscrapers hastened to file plans before the new system became effective. Some of these projects may never be realized and there is therefore an indeterminate element of speculation on the returns.

Omitting the borough of Manhattan entirely, the statement is fairly good. It shows a modest gain for the month as compared with July, last year. The official reports of building permits issued in 105 cities, including all of New York City, as received by The American Contractor, Chicago, total $112,655,752, as compared with $67,062,722 for July, 1915, an increase of 83 per cent. Excluding Manhattan borough the total is $63,450,532, as against $62,217,419 for July, 1915, a modest gain of 2 per cent. The total number of building permits issued in these 105 cities was 22,873, as compared with 22,944 for July, last year. Gains in totals are shown by fifty-one cities, losses by fifty-three.

Building operations for July may therefore be regarded as normal, or somewhat better than normal.

U. S. URGES USE OF BRICK ROADS.

By United Press.

WASHINGTON, July 29.—The United States office of good roads today discussed brick as a road building material.

A Glimpse of the Down Draft Kilns.

Forty-four years ago the first brick road in the United States was constructed in Charleston, W. Va.

"The experience of forty-four years," says the United States office of good roads, "has demonstrated that it is entirely practical to construct satisfactory brick roads.

"These roads now are giving general satisfaction, when properly constructed."

The principal advantages of the brick road according to the government road service are:

1. Durability under practically all traffic conditions.
2. They afford easy traction and good foothold.
3. Easily maintained and kept clean.

The only disadvantage attributed to this type of road is the high initial cost. This is largely offset, it is figured, by the low maintenance and general stamina of the road.

Mention The Clay-Worker.
When writing to advertisers
Mention The Clay-Worker.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

BUILDING PERMITS for the first seven months of 1916, as issued by Building Inspector W. D. Harper, have reached a total value of $8,434,086, as against $5,300,540 for the same period last year. While there has been a steady gain from month to month, July added another $1,222,837 to the amount of gain. The figures for July are 365 permits, representing operations to cost $2,067,794, as against July, 1915, of 324 permits and $844,967. With this condition in the construction line, manufacturers and dealers have been well supplied with orders, and all reports indicate that this will be a most successful year.

Among the larger projects authorized during the past month is the new Wisconsin Telephone Exchange building on Broadway, an eight-story structure with 12-inch brick walls, measuring 120x120 feet, and costing $700,000. The Fuller Construction Company, Chicago, is general contractor. A brick apartment for the Adams Building Company, on Lake Drive, will be three stories, 35x130 feet, and cost $105,000. At Martin and Astor streets, the Builders Investment Company will erect two apartments, with 12 and 17-inch brick walls, both to be four stories, at a cost of $111,000. An $80,000 store and apartment building at Wells and Twenty-seventh streets will be constructed with 16-inch brick walls. The new Mitchell Street State Bank will be of brick, costing $40,000. At Ninth and Cedar streets, a sixteen-apartment building will have 17-inch brick walls, and will cost $36,000. The $45,000 Deaconess Hospital on Grand avenue will be a four story brick structure; and the brick addition to the School of Trades for Girls, at Wells and Eighteenth streets, will cost $115,000.

News from cities throughout the state indicate that building operations in substantial brick and tile structures are featuring the activities. At Platteville, Wis., the Board of Education has been authorized to proceed with plans for the erection of a $100,000 high school, which will be constructed principally of brick. Bids have been called for on the construction of a brick high school at Hixon, Wis. A $50,000 brick building will be erected at Whitefish Bay for the Milwaukee County Day School, Inc., H. W. Buemming, of Milwaukee, preparing plans. The Eagle Club at Marshfield has decided upon a brick club house, and plans are under way. The solid brick high school at Park Falls, Wis., will be erected at a cost of $50,000. Numerous other structures of solid brick or brick and tile, costing up to the amounts named above, are announced as ready for the contractors in practically every city of the state.

Extensive sanitary improvements, which will require considerable vitrified tile, are being announced in various cities. At Whitefish Bay, Wis., the votes acted in favor of a $100,000 bond issue for the construction of a comprehensive sewerage system. Kenosha, Wis., has awarded contracts for sewer extensions in various streets, requiring a considerable amount of vitrified tile sewer pipe, from 12 to 24 inches. The National Drain Tile Company, Terre Haute, Ind., has received a $22,950 contract for the construction of sixteen drain tile laterals in the Root river drainage district near Racine, Wis., which require about 60,000 feet of pipe, from 8 to 20 inches in size.

Brick men express the opinion that this will be a banner year for paving brick manufacturers. More vitrified block pavement is being laid in Wisconsin this season. The initial cost of other types of pavement has for some time been a detriment to the paving brick industry in this state. However, it is gratifying to note that the industry has awakened to the fact that taxpayers "can be shown." An educational advertising campaign has been noted in many state cities where street work is contemplated. The facts are noted that brick pavement is impervious, sanitary, non slippery, durable, dustless and most economical. The question is asked whether or not the taxpayer would rather expend about $30 per front 50 feet additional for a permanently constructed brick pavement that will last for fifty years, or save the $30 for a sheet pavement that may last for six years or six months. At Whitewater, Wis., when the taxpayers were considering the question of what material to use, an advertisement was run in the local paper. A list of fifty-five large cities of the state was given where brick has been used in the past, and asking those interested to write to officials of these cities to get their opinion of what they think of brick pavement. At this writing, the matter has not come up for decision. At Fond du Lac, Wis., George H. Stanchfield, local contractor, will pave with brick at $1.54 per square yard. Vitrified brick pavement is being considered at Abelman, Wis., and Prairie du Sac, Wis., in competition with reinforced concrete. Stoughton, Wis., will pave a portion of Main street with vitrified paving block. La Crosse, Wis., has awarded a contract to the La Crosse Stone Company for a $21,000 vitrified brick paving job on three principal streets. Purington block will be used on the $35,000 job at Washburn, Wis., recently awarded to Thomas E. Wolley, of La Crosse.

Interesting experiments in the manufacture of clay products for commercial use have been made recently in the ceramics course in the mining department of the University of Wisconsin, at Madison, Wis. Some of the products which were made are drainage tile, building bricks of different kinds and hollow building blocks. The test of all clays in the state for commercial use is the purpose of the ceramics course, and samples which are sent in are tested for a small fee. The clays which are most numerous in Wisconsin are those used in the rougher types of clay products. Clay such as is used in the making of fire brick and the other fine products is not found to any great extent in this state.

Very small machines were used at first for making and testing clay products, but the Wisconsin Clay Manufacturers' Association became interested in the improvement of the testing facilities and assisted the department in getting equipment which is now of the best. The equipment includes a standard, down draft, oil-fired kiln; a new modern auger machine, equipped with various dies; a combination dry press, and a dry pan for grinding. Much of the mining engineering machinery is used in the preparation of the clays for tests and manufacture.

The course is expected to play a large part in the developing of the clay products industry in Wisconsin. As the result of tests made last year in this department, a modern plant has been started recently at Marshfield, and several other companies are being organized for the manufacture of drain tile and building brick.

A. BADGER.

A NOTICEABLE IMPROVEMENT IN THE QUALITY OF PRODUCT.

So say the users of the "New Idea" pug mill. A new idea is a rarity, and a machine embodying a new idea is very valuable when, as in this case, it improves the product. The following letter from Mr. Gallagher, a practical brickmaker, is both interesting and convincing, and it is but one of many of a similar nature that The Manufacturing Equipment Company, of Dayton, Ohio, have received. They will be very glad to tell any interested reader of The Clay-Worker more about this "New Idea" pug mill and the other improved clayworking machinery and appliances which are finding much favor in many quarters. Their ad appears on page 179 of this issue.

Veedersburg, Ind., August 27, 1915.

Manufacturers Equipment Co., Dayton, Ohio.

Gentlemen: In the manufacture of the very highest grade of paving block we realize to the fullest the price importance of thorough pugging, which prompted us to try a set of your "New Idea" pug mill hubs and knives.

These have been in use for several months and the results are quite apparent and gratifying, as reflected in smoother finish, greater density and uniformity of our product, and a noticeable improvement in the testing quality of our block.

Can recommend this equipment to anyone looking towards improvement in still-mud products, and feel that there are but few plants who would fail to be benefited by its use.

Sincerely,
THE VEEDERSBURG PAVER COMPANY,
By B. J. Gallagher, Gen'l Mgr.

THE RAILWAY EMPLOYES.

There is at the present writing a sort of deadlock on between the railways of the country and a vast number of organized employes, which, if it developes into a strike, will be perhaps the greatest industrial strike that ever happened in this country. There is not much doubt but what every business man in the country hopes the strike may not develop, and in order to avoid a strike the railroads have proposed to have the entire matter passed upon and arbitrated by the Interstate Commerce Commission or a special commission.

Without undertaking to go into the merits of the case for one side or the other the Clay-Worker desires to join with the business world and express the hope that the strike will be averted, and suggests that business men of the country exert themselves to help prevent such an occurence.

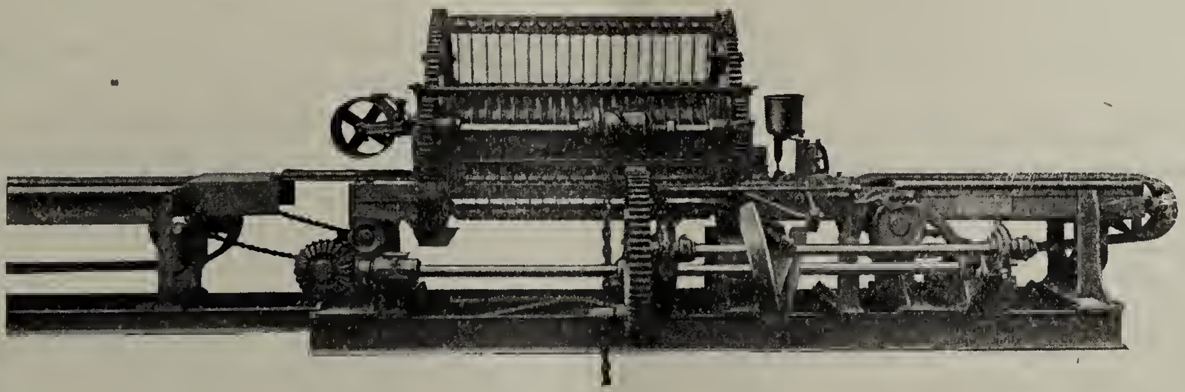
The railroads of the country are perhaps just as selfish in their desires as organized employes, and it has often happened that we have had occasion to disagree with and to berate the railroads for various shortcomings. However that may be, and whatever complaints may be brought against them as to freight rates and business methods, fair dealing is fair dealing and should be encouraged all the time, and surely a disinterested body passing in arbitration upon the matter of dispute will contribute something to fair dealing as between the railroads and their employes. Anyway, this railway matter is one that concerns the public and not merely the roads and their employes, and the public has some rights that should be safeguarded in some way. A general railway strike would be a great industrial calamity to the country and we believe the railway employes as well as the railways themselves should be made to realize this and to understand that there will be but a small element of public sympathy with such a movement and condemnation will be general. This might contribute materially to averting such a disaster.

HOW TRUCKS SHORTEN DISTANCE.

An impressive illustration of how trucks shorten distance was furnished recently in the case of a building material concern which, under the old system of delivery had maintained branches for the convenience of service in certain parts of the city. Some of the branch yards had been equipped at considerable expense and about the time the equipment was thought complete it was discovered that by the use of motor trucks for delivery the time and cost of delivery over long distances had been so reduced that the branch yards did not justify themselves. To state it another way, motor trucks are so reducing distance in making delivery that one can now supply a wider territory from a given central location, a territory that in the old days would require branches at various points to meet the needs. This tendency in motor trucks to eliminate branch yards is perhaps one of the most striking examples of truck service and efficiency.

LARGE CAPACITY AUTOMATIC SIDE CUTTER.

But a few years since a brick cutter which would automatically cut 15,000 brick per day was considered some machine. This was some years ago. Today we illustrate Steele's New No. 18 Automatic Side Cutter, which has a capacity of 15,000 brick per hour, and it does this work regularly and perfectly. Power is applied to this cutter through crank motion, which eliminates all shock and jars caused by sudden stopping and starting, so in this cutter, the column of clay cannot swell. The cutter is equipped with oil rollers or a new plate oiler to oil the column of clay and the attachments are interchangeable in a minute. The cutter is equipped with wire cleaners that operate perfectly owing to the plan in which the wires are suspended. This is an important feature and original with this cutter. For further particulars see ad on page 203 of this issue, or better, write J. S. Steele & Sons, Statesville, N. C.


Steele's New No. 18 Automatic Side Cutter.

PLANT AT RAY, ILLINOIS, NEARING COMPLETION.

The works of the Nicholson Clay Manufacturing Company, Ray, Ill., which is being designed by the Trautwein Dryer & Engineering Company, is rapidly nearing completion. Hollow tile and brick will be manufactured, and the plant is so arranged that it can readily expand as desired. Most of the machinery has been placed and operations should start soon.

NEW OFFICE OF THE HOOK PATENT KILN COMPANY.

Owing to the rapid growth of their business and in order to reach their customers more readily, the Hook Patent Kiln Co., has removed their headquarters from Vigo to Columbus, Ohio. Their new offices are in the Commerce building, where they will be pleased to extend the glad hand to any and all visiting clayworkers. The Hook Kiln Company make a specialty of constructing brick kilns ready for ware and have developed several devices and kiln accessories that lessens the cost of kilns and adds to their efficiency and stability. Their add appears on page 182, but the reader will please remember that they are now in Columbus, Ohio.

Clay tile for flooring is making some progress, too.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Who Will Tell?

Editor Clay-Worker:

I am seeking information as to the dividends paid by the leading and most successful brick companies of the United States. Will any of your readers enlighten me on the subject, stating the percentage of profits earned or distribution in dividends. Hoping to be favored in the matter and thanking you and the readers of The Clay-Worker who may be willing to give the information, I am,

Yours truly, ALEXANDER.

Missouri Brick Company Expands.

Editor The Clay-Worker:

It occurs to us you might be interested to know that since the first of the year we have doubled the capacity and output of our plant, and in order to better serve our growing list of customers and take care of our greatly increased sales we have opened district sales offices as follows: Tulsa, Okla., 312 Gallais Building, with Geo. E. Ford, vice president, in charge; Chicago, Ill., 208 La Salle street, with Mr. H. E. Risher in charge; St. Louis, Mo., with Mr. Robert H. Miller in charge. The main object of these offices will be to give prompt service and personal attention to our customers' interests.

Our plants and general offices will continue to be located at Mexico, Mo., where we expect to maintain the usual Mexico quality, service and general satisfaction of doing business as man to man with the Golden Rule predominant.

Yours very truly,
A. P. GREEN FIRE BRICK COMPANY,
J. B. Arthur, Secretary.

What Is a Reasonable Percentage of Loss by Breakage in Shipping Fire Brick?

Editor Clay-Worker:

Will you or some of your readers kindly impart some information relative to the average waste or breakage in fire brick shipped long distances? We recently had a shipment to the West Indies and found that only about 50 per cent. of the shipment was delivered in good condition. Is this a reasonable percentage of loss? It did not seem so to our company. About 30 per cent. of the brick were chipped and about 20 per cent were warped or crooked. Should this be the case?

Our company is in the market for a few million building brick to be shipped by boat from New York City. We have tried the Hudson River brick, and the masons who use them object, claiming that they are too small to bond well. They run about 7⅞ by 3⅜ by 2¼ inches. Our masons want us to furnish them with brick about 8⅜ by 4⅛ by 2⅛. Any good hard brick of those dimensions will be acceptable, and will be glad to have any reader of The Clay-Worker who can supply them quote us prices. T. H. G., Philadelphia.

An Answer to "Brick Flanagan."

Editor The Clay-Worker:

I have just read "By the Light of the Kiln Fire," in the July issue of the Clay-Worker, and while I understand that these delightful little stories of the author, unknown to me, are not always serious, I am going to take him seriously in this instance and answer the question of Brick Flanagan, which he has passed on to your readers:

Dignity is something that a man cannot lose on certain occasions. It comes to him with the conviction that he has something to learn every minute, and when he appreciates that he cannot hold the half of what he learns. It is the garb of seriousness, worn with humility and because it is the only available garment for the occasion. It is cast off in the presence of loved ones and never works overtime in the home. It is possessed by few and counterfeited by many. Its counterfeit is snobbishness and ignorant assumption and as such it works overtime, appears on all occasions and spreads dislike of man for man, makes wars and devastates the earth.

The "By the Light of the Kiln" stories deserve and probably get a good deal of praise, and I trust will be long continued.

If "Brick" ever leaves home, we have some kiln fires here which are always alight and we would appreciate having him sit with us around them and talk of the things which their glowing eyes suggest. Yours truly,

A READER.

St. Louis Invites Clayworkers to Meet There August 23, 24, 25, 1916.

Editor Clay-Worker:

I am pleased to hand you a copy of the announcement of the coming summer meeting of the American Ceramic Society, and trust you will bring same to the attention of the readers of The Clay-Worker. It has been a long, long time since we Saints have had the pleasure of entertaining either of the great clay-working organizations, and we hope to have a good attendance, and that those who participate will find so much of interest here in our city and vicinity, and will have such a good time, that it will be a forerunner of another national convention in the near future. A most cordial welcome awaits each and every clayworker who will come. Hoping you will be among the number, I am, yours for a good time, H. A. WHEELER.

Announcement and Program of the Mid-Summer Meeting of the American Ceramic Society, St. Louis, Mo., August 23, 24 and 25.

The Eighteenth Summer Meeting of the Society has been arranged by the committee appointed for that purpose, and will meet at St. Louis, Mo., at 9 o'clock Wednesday morning, August 23, and will conclude Friday evening at the same city with the return from Alton, Ill.

St. Louis is the center of a large and varied clay industry for which most of the raw materials are produced in the adjacent country. The city and river are of great historic and literary interest, and the exceptionally fine parks, gardens and museums make the location selected for the summer meeting, one which should appeal to each member of the society as a desirable part of his vacation itinerary.

The program follows:

Wednesday, August 23.

The members are expected to meet in the lobby of the New Washington Hotel at Delmar and Kingshighway at 9 a. m. At promptly 9:30 they will leave for the works of the Mississippi Glass Company. This is a plant of particular interest to ceramists, being one of the very few factories to manufacture cathedral glass.

In the afternoon the three plants of the Hydraulic Press Brick Company at Manchester avenue and Kingshighway will be visited. At these plants, common brick, face brick, paving brick and enamel brick are manufactured by the dry-press and stiff-mud methods.

The evening will be spent at an informal gathering at one of the open-air summer gardens located near the hotel.

Thursday, August 24.

The party will leave the hotel at 9 a. m. for the Highland Fire Clay Company—a plant devoted to the washing and preparation of glass-pot and other high-grade fire-clays.

From there the members will proceed to the Sewer Pipe Factories of the Evans & Howard Company, which is especially interesting on account of a recent installation of the widely discussed system of Scientific Management.

At 12:30 the party will leave for the Laclede-Christy Company's Manchester avenue plant, and, after a lunch served at the company dining room, will go through the exceedingly interesting factories of the company. Members are also especially invited to visit the well-equipped laboratories at the Christy plant.

The next stop will be at plants of the St. Louis Terra Cotta Company and the Winkle Terra Cotta Company—factories so well known by reputation to all members of the society as to require no description.

At 6:30 p. m. dinner will be served at "The Highlands"—the only amusement park in the country operated in connection with a clay plant.

Friday, August 25.

The party will leave the hotel at 8:30 a. m. to take the 9:30 boat of the Eagle Packet Company (foot of Locust street) for Alton. The Mississippi steamboat is known throughout the world, and a trip up the historic river to the Alton paving brick plant should furnish a happy combination of information and pleasure.

Luncheon will be served on the boat, which stops four hours at Alton, allowing ample time for the inspection of the Alton Brick Company's gas-fired producer kiln and the bottle factory of the Illinois Glass Company, the largest in this country, where blowing machines are replacing hand blowing.

The boat leaves Alton for St. Louis at 5 p. m., where the party will disband.

There are numerous other features of interest to clayworkers in and about St. Louis, and the reception committee will be glad to assist the visiting members in reaching any points of especial interest.

Hotel Accommodations.

Arrangements have been made with the New Washington Hotel for an average rate of $1.50 per day to members.

Committees.

H. A. Wheeler, Chairman Local Committee, 510 Pine street.

G. R. Truman, Chairman Reception Committee, 5815 Manchester avenue.

R. D. Hatton, Chairman Finance Committee, Manchester and Sulphur avenues.

Dwight T. Farnham, Chairman Program Committee, 920 Market street.

Reception Committee.

Fred S. Ball, Mandle Clay Mining Company.
C. W. Berry, Laclede-Christy Company.
E. L. Blackmer, Blackmer-Post Sewer Pipe Company.
R. F. Grady, St. Louis Terra Cotta Company.
J. L. Green, Laclede-Christy Company.
R. D. Hatton, Laclede-Christy Company.
J. J. Koch, 3325 Carolina street.
I. Mandle, Mandle Clay Mining Company.
S. Mandle, Mandle Clay Mining Company.
G. D. Morris, Evans & Howard Company.
Lemon Parker, Parker-Russell Company.
R. S. Rhoads, Evans & Howard Company.
G. E. Thomas, Highlands Fire Clay Company.
W. J. Volz, Evans & Howard Company.

Address all communications to the Chairman of the Local Committee, Room 420, 510 Pine street.

PLATTSBURG, PATRIOTISM AND PLEASURE.

PATRIOTISM and a desire for the perfection of physical powers has made Plattsburgh, N. Y., the mecca for many serious-minded men from all walks of life. Volunteers, who are accepted for service, whether rich or poor, high or low, meet there on a common level. That of itself is a leaven in the affairs of life that spells improvement in a larger measure than is possible in the ordinary course of business affairs.

#407C
Sq.4 Co.C 6th Training Regt.

Prof. Edward Orton, Jr., snapped while waiting to take his turn at the target range. He had previously made 178, giving him the "marksman" classification. He entered as a private, but has been promoted to regimental Sergeant Major. He writes: "The 100 mile hike starts tomorrow; wish you had come with me, then you would be able to wear your pants without suspenders all right."

When professional men, merchants, lawyers, business men and ordinary toilers gather voluntarily for a course in military training, as they have at Plattsburg, there is no mistaking the spirit of preparedness that has been awakened in America. That great benefit will accrue to the nation is quite evident to all thinking citizens.

A roster of those who have enlisted in this movement would disclose many notables whose friends would be surprised to know that they are in active training for military service. Not a few of the volunteers are actuated by the desire for physical development, and the benefits derived in that respect alone will be tremendous. We are pleased to present to our readers the accompanying photo, giving a glimpse of camp life at Plattsburg. The central figure, Prof. Edward Orton, Jr., Columbus, Ohio, will be recognized by a host of friends in the clay industry, particularly members of the American Ceramic Society, who will be surprised to know that he is taking a six weeks' course of training as a common soldier. In this new experience he is learning the lesson of obedience, which he has preached to the boys of the Ohio State University in years past, and which is essential to a large measure of success in life, no matter what one's calling. We hope to chronicle Prof. Orton's experiences and observations, "When the cruel war is over."

Written for The Clay-Worker.

THE CHICAGO SITUATION.

WITH ANYTHING like a normal run of autumn business, the year 1916 will stand high in the building annals of Chicago.

While building operations during the last week or two have been falling behind the figures for the corresponding period a year ago, the showing for July was good, with a nice increase over July, 1915, while for the seven months of the year a remarkable increase was shown.

For example, the permits issued for the first seven months numbered 6,395, covering 202,400 feet of frontage and representing a total estimated cost of $71,115,700, as compared with 5,378 in number for the corresponding period of 1915, covering 162,876 feet of frontage with an estimated total expenditure of $45,225,880. This is an increase of 1,017 over the number of permits, 39,524 in feet of frontage and $25,929,820 in cost—which is an increase of 57.34 per cent.—a remarkable showing when it is considered that the total cost of permits issued for 1915 amounted to $97,291,480, which was with one exception the largest in the history of the city. That exception was in 1911, when, in order to secure the benefit of an expiring building ordinance permitting a height of 260 feet a great many permits were taken out by property owners in the downtown district. The beginning of only a trifle over $26,000,000 in building operations in the remaining months of the year is all that is necessary, therefore, to bring the 1916 record to a point that will make it second to any ever made in this man's town.

The July figures were 844 permits issued, covering 25,708 feet of frontage, with an estimated cost of $8,076,800, as compared with 830 in number for July, 1915, having a frontage of 25,393 feet and a total estimated cost of $6,455,630, which is an increase of fourteen in number, 1,315 feet frontage and $1,621,170 in estimated cost.

Ground already has been broken and foundations are being set for the new $500,000, eight-story office building which the Illinois Central Railroad Company is erecting at East Sixty-third street and Dorchester avenue. A new suburban station is included in the building plans, and the improvement will greatly enhance values in this vicinity.

One of the largest apartment buildings in the city is to be erected at the southeast corner of Greenview and Birchwood avenues. The site is 150x100 feet. It will be improved with a high-grade, fire-proof building of five stories, to contain ninety-six apartments in one, two, three and four rooms. There will be three stores on the ground floor, the main cafe, billard hall and ladies' waiting room. The building for which designs have been prepared is expected to cost $230,000. Apartment building in the district south of Jackson Park on the South Side is to be augmented by the construction in three blocks of this territory of new structures representing an aggregate estimated cost of $525,000, according to authentic reports in real estate circles.

Work is practically completed on one of the largest buildings in Evanston being erected at the southwest corner of Davis street and Oak avenue, at a cost of $125,000. The property really comprises two buildings, the one on the corner which is known as the Davis block contains ten stores, five offices, nine two-room apartments and five four-room apartments. The inside structure is known as the Oak Court apartments and contains thirty-six apartments, each with a sun parlor. A children's playground is provided in the basement.

Building operations on the West Side are showing unusual activity, construction being under way on numerous structures of all types. Work recently has been started on an attractive dancing academy at 120 North Crawford avenue, at a cost of $125,000. The building will occupy a lot 225x150 feet, and will be of fire-proof construction. The front of the building will be two stories high, finished in pressed brick, terra cotta and tile. The building also will contain eight stores. It is said the dance hall will be the largest in the country, with accommodations for 5,000 people. The hall will have balconies with seating capacity of 1,000.

The work of rebuilding the downtown district goes steadily on, although the completion of the Lyon & Healy and Kimball Piano Company buildings, which is virtually now accomplished, leaves no especially large structure now in process of construction within the loop district.

Chicago is growing normally and in healthy and all-round manner, and there is little fault to be found, except that structural iron is rather high and labor sometimes a little hard to get.

SCRIP.

THE BURNING QUESTION.

Fuel economy is always an important question for clay-workers. An interesting little leaflet, giving much information on the subject, has been issued by the United States Rocking Grate Company, Chicago. According to the illustrations, his Satanic Majesty, who ought to be an authority in such matters, has set the seal of his approval on the U. S. Self-Cleaning Grates, which are illustrated and described in the leaflet, copy of which can be had for the asking. It's a "devilish" good thing.

F. W. DENNIS PLAYS A RETURN ENGAGEMENT AT ROSSFORD, OHIO.

Last year Mr. F. W. Dennis, the kiln builder of Norfolk, Va., built some kilns for the Toledo Vitrified Brick Company, manufacturers of brick by a new process. They make both building brick and fire brick from silica, and these when burned are excellent for the purposes intended. The Dennis kilns proved in every way so satisfactory that he has been called back and given an order for four additional kilns, which are now in course of construction. When same are completed we will favor the readers of The Clay-Worker with a detailed description of the plant and its product. In the meantime, any of our readers wishing further information in regard to Dennis kilns are referred to his ad on page 189.

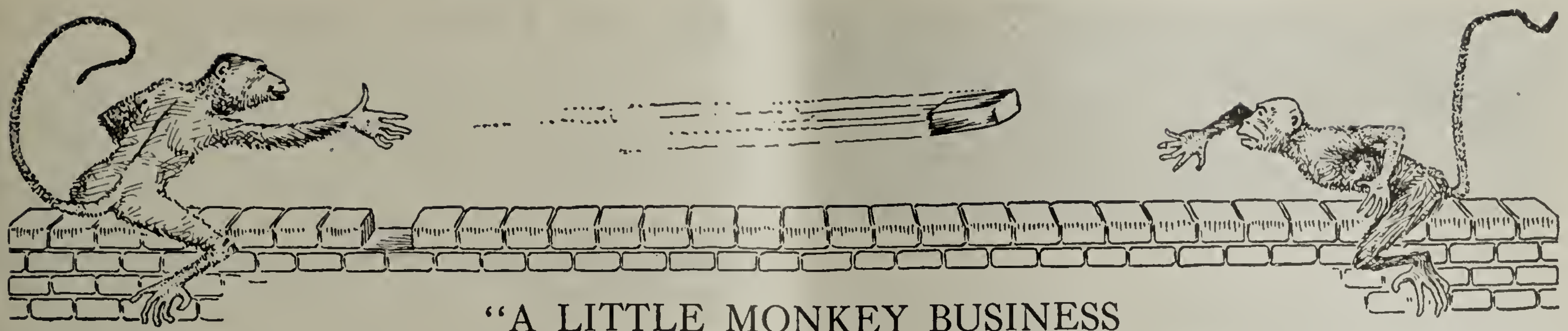
WHERE AUTO LICENSE MONEY GOES?

Lambert G. Sullivan, writing in the Chicago Daily News, has the following to say about the automobile license money from the various states:

"More than $16,000,000, or a little more than 90 per cent., of the fees collected by the various states of the Union from automobile fees was expended on road building in 1915, according to a compilation recently published by the office of public roads of the Federal Department of Agriculture. According to the publication, 2,445,664 motor vehicles were registered in the year, with a total of $18,245,713 for registration. This is an increase of 734,325 vehicles and $5,863,760 over the previous twelve months.

"There is great inequality in the registration fees charged by the different states. The average for the United States was $7.46. The state of Vermont, however, secured in 1915 a gross revenue of $18.10 for each motor car, while Minnesota received only about 50 cents annually for each car. In Texas and South Carolina, no annual registration fees are collected, the only requirement being a county fee of 50 cents and $1, respectively, for perennial registration. Most of the states, however, also levy annual taxes on motor vehicles, and this adds importantly to the public revenue contributed by the owners of motor-propelled vehicles."

BUILD WITH BRICK



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

LIFE IS WHAT WE MAKE IT.

Sunshine.
Laugh and smile
All the while,
Grin and bear,
Deuce with care.
Peddle cheer,
Good times near,
Slap and whack
On the back.
Never growl,
Whine or howl,
Good old earth
Full of mirth.
Try—Persist!
OPTIMIST!
—ANON.

Rain.
Sigh and cry,
Make red eye,
Moan and groan
For nice home.
Let tears flow,
Make a row,
Peddle drear,
There's no cheer.
Bad old life
Full of strife.
Take a knife,
Murder wife
Go—Enlist!
PESSIMIST!
—M. YAEGER.

* * *

Take Advantage.

"Money will not take a man to the top, Henderson."

"I know; but it will give him a lot more room at the bottom."

* * *

Not Particular.

"I want a loaf of bread."

"White or graham?"

"Doesn't matter; it's for a blind woman."

* * *

Unchecked.

"How did Teller get his cold?"

"All the drafts in the bank go through his cage."—Boston Transcript.

* * *

Passed the Test.

"So you want to marry my daughter, eh?" snorted the old man. "Do you consider yourself financially able to do so?"

"Well," replied the suitor, "after a fellow has bought candy and flowers for a girl for a year, and has taken her to the theater twice a week and is still not broke, I guess he can afford to get married."

* * *

The Real Reason.

Among the questions asked of a Sunday school class by a visitor was, "Why was Lot's wife turned into a pillar of salt?"

For a moment there was silence, and then a small boy piped out, "I s'pose it was 'cause she was too fresh."—Exchange.

* * *

No Interference.

When the jury in a Western court found the accused guilty of the crime charged, the prisoner rose in the dock and dramatically exclaimed:

"May heaven strike me dead if I am guilty!"

The judge waited a few minutes, and then said:

"Prisoner at the bar, since Providence has not seen fit to interfere, the sentence of the court will now be pronounced."—Selected.

* * *

Imitation.

I am told of the influence of American hustle on a Chinaman when he came to the city. He found signs on lunch places adjoining his laundry, reading: "We never close," and "Open all night."

Soon afterward a sign appeared in his laundry window: "Me wakee, too."—Selected.

* * *

Proof That He Knew How.

After the clock struck eleven the peevish father strode to the top of the stairs and called down:

"Mabel, doesn't that young man know how to say 'good-night'?"

"Does he?" echoed Mabel from the darkened hall below. "Well, I should say he does."—Ladies' Home Journal.

* * *

Not To Be Fooled.

"Tell me noo, Jamie, what was the most wonderful thing you saw when at sea?"

"I think the strangest thing I saw was the flying-fish."

"Noo, laddie, dinna mak' a fule o' yer mither. Wha ever heard o' a fish fleein'?"

"Another strange thing I saw when crossing the Red Sea. We dropped anchor, and when we raised it again there was one of the wheels of Pharaoh's chariot entangled on it."

"Ay, laddie, I'll believe that. We've Scripture for that."

* * *

Knew What She Wanted.

A maiden well advanced in years used to wait every morning for the postman, a bachelor of about her age, and ask him if there were not a letter for her. Several weeks passed thus, but the anxiously expected letter did not arrive. Finally, one morning the postman said to her:

"Well, tomorrow you shall get your letter if I have to write it myself."

"That's right; do it," replied the old maid. "I shall be delighted to accept it."

"Well," said the postman, smiling, "what do you want me to write—a business letter or a love letter?"

"If you mean business, please write a love letter!" was her blushing reply.—London Scraps.

* * *

The Difference.

Some time ago little Jimmy Smith's family moved into a new community, and immediately little Jimmy was seized by a pretty young woman and hauled off to Sunday school.

"James," sweetly remarked the young woman, teaching her class on the following Sunday, "you know, of course, all about the Sabbath?"

"Yes, ma'am," was the unhesitating rejoinder of the youthful James.

"Good!" commended the teacher, with a pleased expression. "In what way does Sunday differ from the other days?"

"You sleep later and go fishin'," answered James, with the air of one who knows.—Philadelphia Telegraph.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVI. AUGUST, 1916. No. 2.

CURRENT COMMENT.

Remind the prospective builder that brick is one item which is not afflicted with war prices.

* * *

Brick boosting should include a little price boosting, too, because in most places prevailing prices do not leave a fair margin of profit.

* * *

Seeking to eliminate your competitor to get rid of competition is bad business. The better plan is to get together and talk about how to live and let live.

* * *

Let us not forget that the "Build With Brick" slogan which has done so much good for the clayworking industry is still effective, and should be kept before the public.

* * *

If you will look for the good points in the men you meet, instead of persistently centering your attention upon their faults, you will get more satisfaction out of life and make more friends.

* * *

Better arrangements for rural credits and banking should pave the way to more permanent and pretentious building, which should mean the use of more brick and other clay products on the farm.

* * *

If there is any man who hasn't taken a hand in talking about what we may expect when the war ends and what we should do to be ready, he will please speak up, for this is a subject that everybody seems to be taking a whack at.

* * *

If Jules Verne should come back to earth now he would probably feel that he was lacking in imagination when he pictured in his mind those undersea trips that made his fiction famous, because freighting across the ocean in an undersea boat is going it considerably better than he imagined it.

* * *

Floods have done considerable damage in parts of the country, but even at that the agricultural districts are safe and prospering.

* * *

There was no need to start shark stories to turn attention to bathing resorts this year, for the weather man has been attending to that.

* * *

Some use smokeless coal for smoking off their kilns, while others devise furnaces and burning methods, in which they can use any kind of coal.

* * *

Our fire brick friends have not only prospered during the past year, but they are still at it, and many of them report more orders than they can take care of promptly.

* * *

Whether brick is made of soft mud or stiff mud, it should always be burned to a proper hardness, because the old soft burned or salmon brick is almost a thing of the past in the right kind of modern kiln operations.

* * *

We are coming to the point where practically all handling of raw material and also of finished products will be by mechanical power of some kind—motor trucks, power conveyors or something other than man power and horse power—because the new way is cheaper and better.

* * *

The petroleum production of the United States broke all records in 1915, with a total of 281,104,104 barrels, at an average price of 64 cents a barrel at the wells, making a total well value of $179,462,890. The total of what the consumers paid for oil and gasoline is another story and has not been tabulated.

COST OF FIRE-PROOF DWELLINGS.

We are being told now by people in a position to speak authoritatively that the prevailing belief that fire-proof or incombustible dwellings are impractical because of excessive cost, is a mistaken idea that should be dispelled. Good authorities on the subject are now estimating that fire-proof dwellings are actually being constructed in some parts of the country, at a cost not exceeding 10 to 15 per cent. above that of first-class combustible construction. This is a small price to pay for complete safety against loss of property and the danger to life from fire. It is strongly suggestive of the fact that the time is coming when people will not only build with brick, but will build fire-proof throughout.

FIRE LOSS ON DWELLINGS.

There is some pretty hot stuff for our friends in the lumber trade, who some time ago sought to show up by statistics that there are more fire losses in brick buildings than in frame, in a book gotten out by the National Board of Fire Underwriters, called "Dwelling Houses," a code of suggestions for construction and fire protection.

On page 10 of this book are some figures compiled by the National Board of Fire Underwriters, showing the fire loss from all causes on dwellings in thirty-eight states for the year 1915. The figures are as follows: Brick dwellings and contents, $2,343,665; frame dwellings and contents, $22,310,524. In round numbers, this is just ten times as much fire loss in frame dwellings as shown in brick dwellings. This, too, notwithstanding that the term brick includes all buildings having the masonry walls and wooden interior construction—that is, frame partitions and cross walls on the interior with wooden joists and floors. The frame buildings include buildings with wooden frame covered with stucco, brick veneer or metal.

This is a pretty severe puncture for that bubble of assertion that there are more fire losses in brick buildings than in frame.

ROOFING TILE HEADS THE LIST.

In a discussion of what is termed approved roofing, the National Board of Fire Underwriters says that wherever possible the people should use a fire-resisting roof covering, because the safety which it affords is well worth considerable additional expense. Also, it points out that the life of the best fire-resisting roofing is longer than that of the wooden shingle. Then in recommending what is termed approved roofing, tile leads the list, followed by tin, slate, asbestos, etc. This is recorded here as a reminder to those interested in the development of the roofing tile industry, that they not only have the best product of the kind in the country, but they have therein the best kind of an argument to boost this product, and by proper exploitation to increase greatly from year to year the volume of consumption of burned clay roofing tile.

BRICK VENEER ARGUMENTS.

There is a pretty general disposition among brick people to argue unreservedly against the brick veneered house. There is room, too, for argument in favor of the solid brick wall as compared to the brick veneered wall; but the making of this argument should not lead to a sweeping condemnation of the brick veneering idea as seems to prevail among the brick people, because sometimes it develops a case of biting off the nose to spite the face.

There comes to the writer's mind now a specific case of a friend building a new home in a location where it was a little difficult and expensive to secure brick. He would have made it a brick veneer, but arguments were produced to show that brick veneer and frame construction do not go well together, and the final result was the building of a frame constructed home with metal lathe and stucco on the outside instead of brick veneer.

To get the right angle on this brick veneer proposition, we should consider it in comparison with the frame with weatherboarding, as well as consider it in comparison with a solid brick wall. Any man who considers it fairly from this viewpoint will concede that brick veneer offers advantages over weatherboarding, and that the outer wall of brick is better and more economical in the end than the thin siding of lumber commonly put upon frame houses.

Quite a lot of play is being made upon the idea that brick veneer is a modern form of deception; that the veneered brick house is deceptive and not what it pretends to be, and that it is a modern makeshift.

This is really far from the truth. The brick veneered house is practically as old as the brick industry. Back in the days of the early Chaldeans we find the brick veneer idea in existence, though in a somewhat different form from the present. It was the practice then to build the body of a house with sun-dried brick and an outer wall or brick veneer of burned brick which would stand the exposure to the weather better. There could, perhaps, also be found some records showing where frames of timber and piers of stone were used and an outer brick veneered wall constructed. Anyway, the brick veneering idea is practically as old as the brick business.

According to the insurance people, the brick veneered home is classed as a frame home, and when we class it in this way and view it from this angle, the brick veneered house is undoubtedly an improvement upon the house sided up with weatherboarding. Also, it is a step forward in brick utilization, and instead of condemning it the brick trade should encourage it as a step toward brick and an improvement over the purely lumber house, and as being the next best thing to brick walls through and through.

NO WAR PRICES ON BRICK.

Everywhere along the line of the things we need or desire the war in Europe is being blamed for the higher prices of a long list of requirements, from milk and meat to pearls and diamonds. Everywhere on all sides prices have doubled and quadrupled on this item and that item. Articles in the magazines and newspapers have been setting forth specifically where and how and how much the war has increased prices in certain items. There is one item, however, of importance, one among the essentials, too, on which there are no war prices. That item is the brick with which our homes and other buildings are erected.

Brick prices vary somewhat with local conditions and with the quality of the brick, whether it is common brick or fancy face brick, so that many different prices may be found in the community. However, taking the average the country over, brick prices today are practically no higher than they were twenty years ago. This seems a bit surprising when we consider that the cost of everything going into the manufacture of brick has increased materially during the last twenty years. The ground of clay bank or shale with which the brick is made is more valuable today than it was twenty years ago; laborers and skilled workers are paid nearly twice as much in the way of wages as they were twenty years ago; machinery and mill supplies cost more; there is casualty insurance, a thing not heard of in the pioneer days, and many things that seemingly should add materially to the cost of brick—things which are pointed out as being responsible for the higher prices of many other products. Yet the cost of brick for building operations is practically the same today as twenty years ago. This is due in a great measure to improved machinery, which though it has called for the investment of much more capital in the manufacturing of brick than was formerly required, does in a measure offset many items of additional cost by reducing the manufacturing cost through increasing the quality of output and saving labor expense generally.

The important thing about all this to the prospective builder is in the fact that one doesn't have to pay a war premium now for the materials of construction. There are no war prices on brick, and the only additional cost that may be attached to building through war prices is that of the higher value of nails and other incidental items in building operations. The brick itself has not increased in price because of war or anything else.

THE BEST AND CHEAPEST HOME.

You have, no doubt, often heard the old adage that, "the best is the cheapest." Well, when it comes to home building, this is not merely an old adage, but it is an established fact that is being verified every day.

That the home with brick walls is better than one of frame is an established fact that no one will likely have the temerity to dispute. The main argument put up by those who would try to persuade you to build with lumber instead of brick is that it is cheaper; that you can save money by so doing.

The brick house is not only the best, but it is also the cheapest.

When the walls are built of brick one is saved the expense and worry of repeated painting and has a permanent home that will stand for ages. There is practically no deterioration with time, consequently the brick home holds its value while the frame house after a few years is not worth anywhere near what it costs.

You effect a saving in fire insurance, and in the winter months there is a saving in fuel. The saving in fire insurance, painting and repairs is much more than the interest on the additional investment required to build with brick, enough more in fact that in a few years it will pay back the principal and prove the assertion made above that the best is the cheapest.

Then you have the satisfaction of the best, which is something that lingers long after the cost is forgotten. There is no home in which a man takes more pride than a good home built with brick. It suggests stability and permanence. It offers a safeguard against fire and it will stand for ages.

In fact, it is a real home of permanence and not merely a temporary shack, and instead of being an expensive luxury that only the rich can afford, it is really the cheapest home a man can build.

IN MEMORY OF THE HOOSIER POET.

The whole civilized world mourns the death of James Whitcomb Riley, which occurred at his home in Indianapolis, July 22, 1916. For years past his poems have charmed old and young the world over, and for generations they will be a source of unending pleasure, bringing peace and joy to the hearts of mortals who will be a little more charitable one to another for the spirit of good will and simple good fellowship which is the soul of his word songs. The following is a touching tribute to our Jim, "peace to his ashes." He will live in memory always.

RILEY.

Although up to a brighter sky
You turn a brighter brow,
The Little Girl you bade, "Don't cry!"
Must disobey you now.
Beside the Little Cripple's chair
She's kneeling, tearful-eyed,
Although she knows that you fore'er
Are On the Sunny Side.

Amid the land that's ever new,
Amid new singers' ranks,
There'll be the same deep joy for you
As on the Deer Crick Banks.
For with your posies in her hands
And on her lips your hymn,
There Little Orphant Annie stands
To kiss her Uncle Jim!

O you who sang The Days Gone By
In your own perfect phrase,
I hear your treble, far on high,
Singing the day of days.
The veil that hid God's mystery vast
Lifts as a curtain does,
And now Jim Riley, at the last
You Know Who Santa Wuz!

No Gobble-uns'll Git You, Jim!
You've gone across the night
To find amid the seraphim
The Raggedy Man in white!
And in the paths of children's feet,
Lit by the children's smile,
You go unfaltering to meet
The true Cross-Bearin' Chile!

The Funny Little Fellow cries
In vain for you to stay.
You've gone to seek beyond the skies
The Land of Whereaway.
And "Good-by, Jim!" the Dwainie elf
Sighs 'neath her Spirkland hat,
She need not say, "Take Keer o' yourself!"
God's looking out for that!

(John O'Keefe in the New York World.)

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SAND-LIME BRICK.

The geological survey now has available for distribution its annual statement on sand-lime brick. During the year 1915 the quantity of sand-lime brick sold showed an increase of 7,014,000 brick, or 4 per cent., and the value showed an increase of $76,592, or 7 per cent., over 1914.

ARMOR PLATES.

The one thing we can easily get an impression of from the wrangle that has been going on between Congress and the steel folks about whether the government should make its own armor plate or buy it, is that we will probably be able to get what armor plate we need and very likely get it at a lower cost than we used to pay. These wrangles and arguments are amusing at times and provoking at others; but, after all, they furnish enlightenment to those who can read between the lines, and they do some good in a way. One thing sure is the average man has more ideas about armor plate now than he had a year ago.

OCEAN DEPTHS.

In these days of the submarine it is interesting to know that the deepest regions of the ocean are commonly close to the shore and are believed to have been caused by the crumpling inward of the earth's crust, due to the pressure of the near land.

Such, according to the Scientific American, is the "Tuscarora deep," a long, narrow trough which extends northward from Japan along the coast of Asia, its bottom being more than 27,600 feet below the surface of the sea and 12,600 feet below the general level of the ocean's floor.

The greatest recorded depth of the ocean is only 409 feet more than six miles, but of the 9,750 soundings that have been made and reported in water more than 1,000 fathoms in depth only seventeen are greater than 4,000 and only three exceed 5,000 fathoms in depth.

The Highest Quality of Clayworking Machinery.

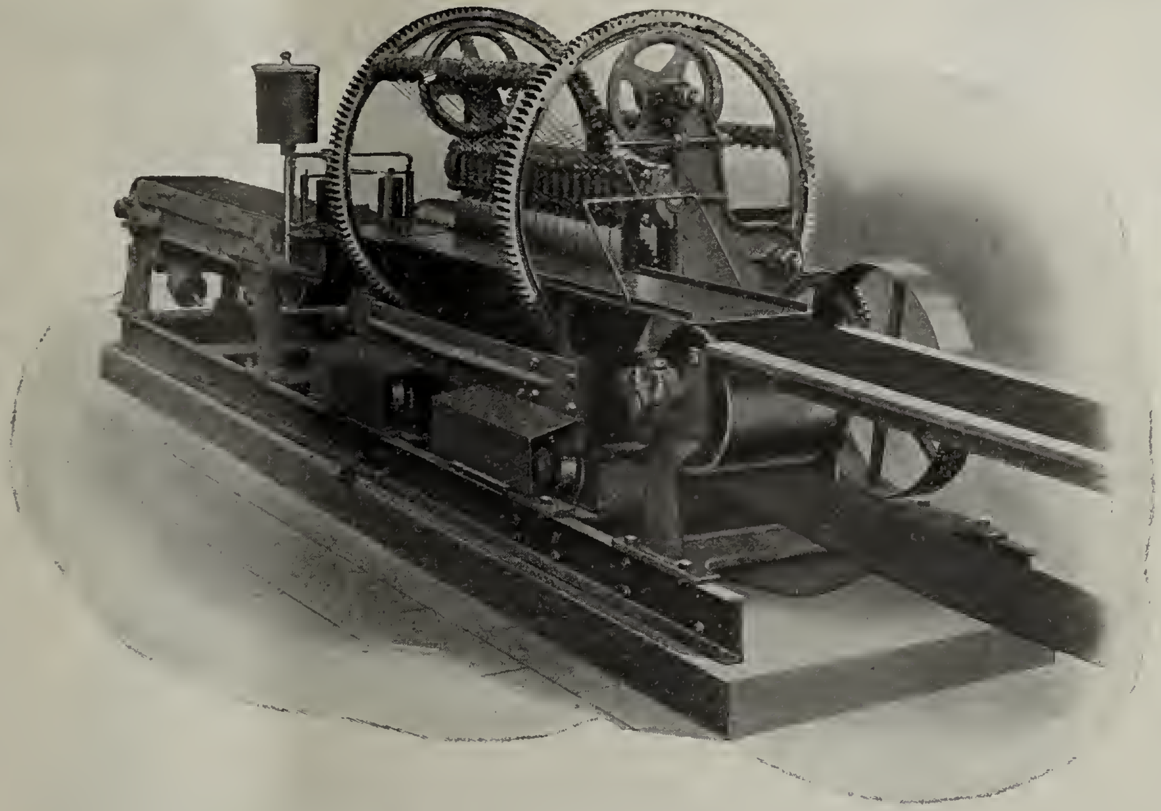
The AMERICAN CLAY MACHINERY COMPANY.
The Haigh Continuous Kiln
BUCYRUS OHIO
BUILT RIGHT RUN RIGHT

CUTTER CORRECTNESS

"Correctness in Cutters" means "contentment in clayworkers."

We have correctness in The American No. 342 which is sure to keep your plant free from cutter troubles.

We have a Bulletin on the No. 342 cutter which we will be pleased to send you.



American No. 342 Rotary Automatic Cutter.

Haigh Heat Hints

A manufacturer in the East has just reported that he is burning his brick with 500 pounds of slack coal to the thousand brick. Others are doing even better. That ought to be hint enough to every careful brickmaker. We will be pleased to give you name and address if you are interested. Or we will be glad to take you to the nearest Haigh Kiln in order that you may examine it and ask the men who are daily saving half the fuel and half the labor of other burning systems.

Send for bulletin on the Haigh Kiln. A big picture of a Haigh Kiln, suitable to post in your office or plant, will be sent upon request.

THE AMERICAN-HAIGH CONTINUOUS KILN
FOR BURNING
BUILDING BRICK, PAVING BLOCK, HOLLOW WARE, FIRE BRICK, DRAIN TILE, FIRE PROOFING, ETC.
THE AMERICAN CLAY MACHINERY CO.
BUCYRUS, OHIO.
U.S.A.

American Haigh Continuous Kiln.

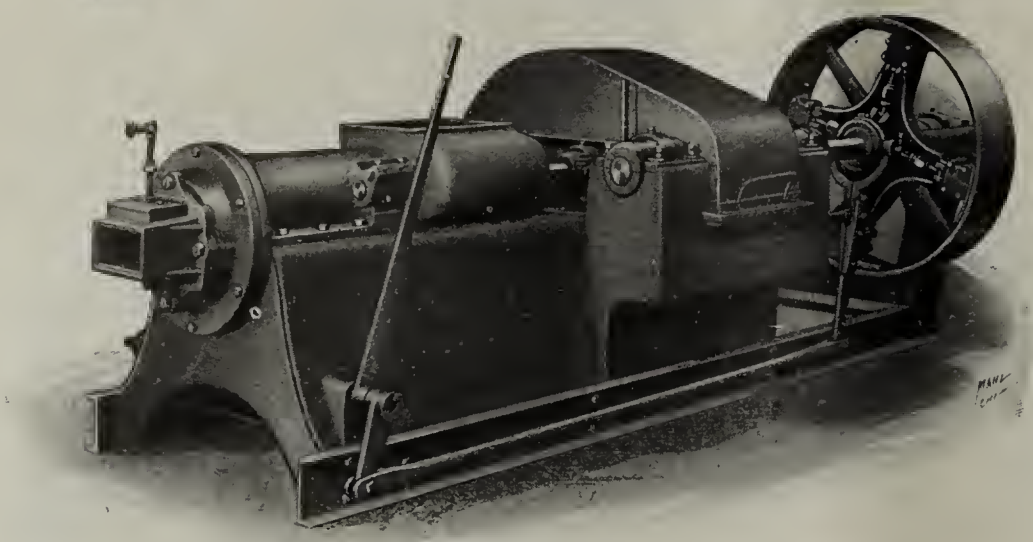
The American Clay Machinery Co., Bucyrus, Ohio, U.S.A.

World's Largest Manufacturers of Clayworking Machinery.

The Highest Quality of Clayworking Machinery.

The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS OHIO
BUILT RIGHT RUN RIGHT

CONTINUOUS CAPACITY



American No. 233 Auger Machine.

A big spurt for a few days wouldn't make much of a showing on an annual production sheet. That's why we have incorporated into the American No. 233 Auger Machine principles and construction that will insure "Continuous Capacity."

You can depend on this machine each day of the 365 in the year and if that doesn't give capacity enough just speed it up and run nights besides. The No. 233 will set the pace for your plant if you give it the opportunity. Send for the Bulletin we have issued on the No. 233 Machine.

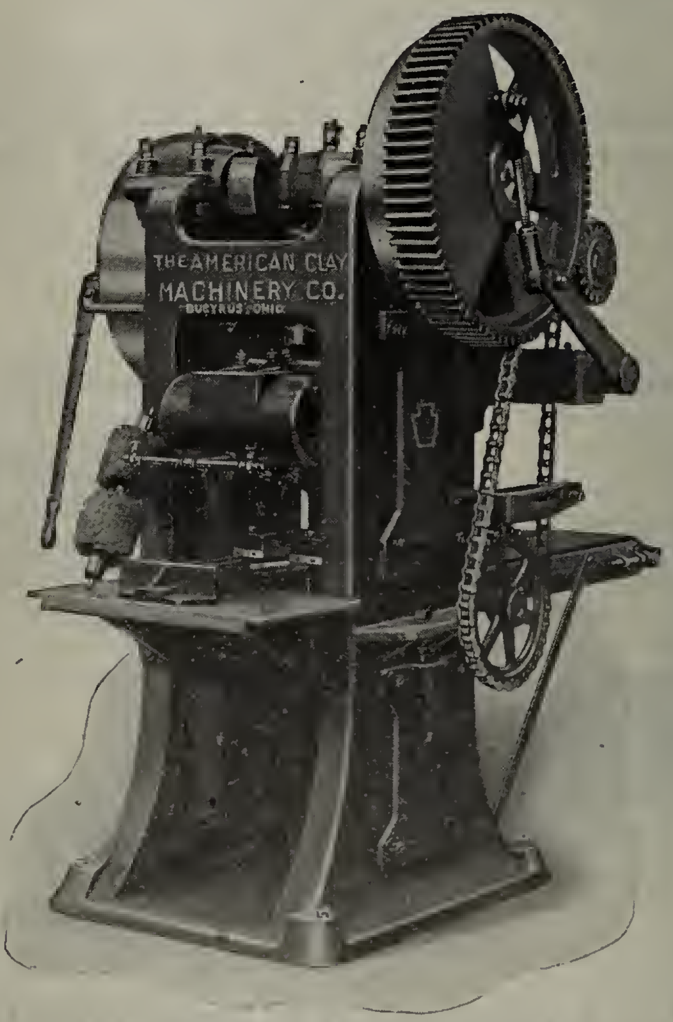
REPRESS REPUTATION.

Our reputation on Represses has always been good from the time we put the Eagle Repress on the market a quarter of a century ago. Our American No. 292 Repress is a credit to the "Built Right Run Right" family and has received the commendation of some of the best and most prominent manufacturers in the country.

Send for our Bulletin on the No. 292 Repress. It tells you how it's made and gives you an insight into its quality.

If there is any big or little need in in clay machinery or appliances we will be pleased to hear from you.

The American Clay Machinery Co.
Bucyrus, Ohio



American No, 292 Repress.

World's Largest Manufacturers of Clayworking Machinery.

The Highest Quality of Clayworking Machinery.

The AMERICAN CLAY MACHINERY COMPANY
BUCYRUS, OHIO
The Haigh Continuous Kiln
BUILT RIGHT RUN RIGHT

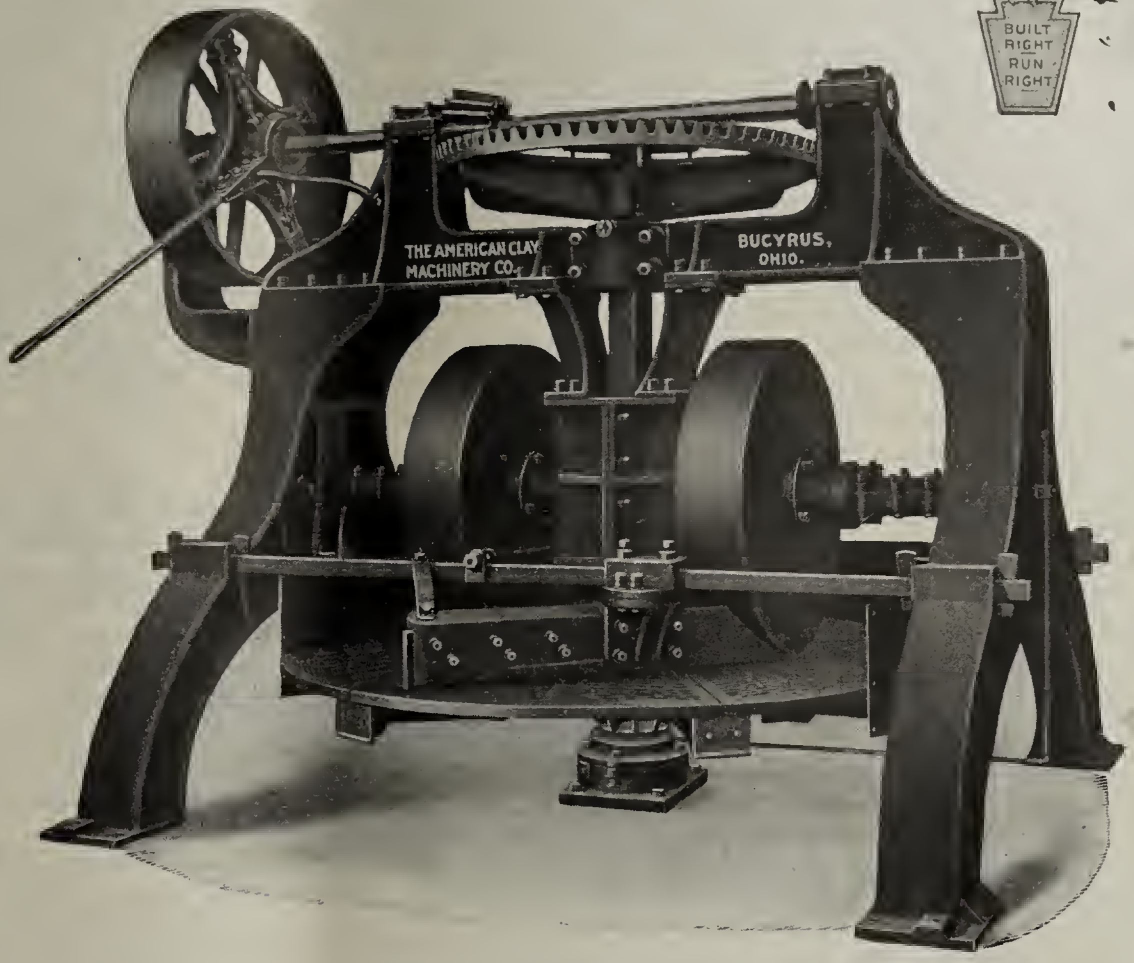
PAN PERMANENCE

Pan Permanence is in the building and the care of the pan. We have not only built into the American Line of pans a quality which means permanence but we have incorporated many features which make the "Care of the Pan" much easier.

American Pans will do more, at less cost, than any other pans.

Ask for list of pan users and let them tell the story of American Pan quality.

We have over a thousand pans in use. Send for our Dry and Wet Pan Bulletin. Its yours for the asking.



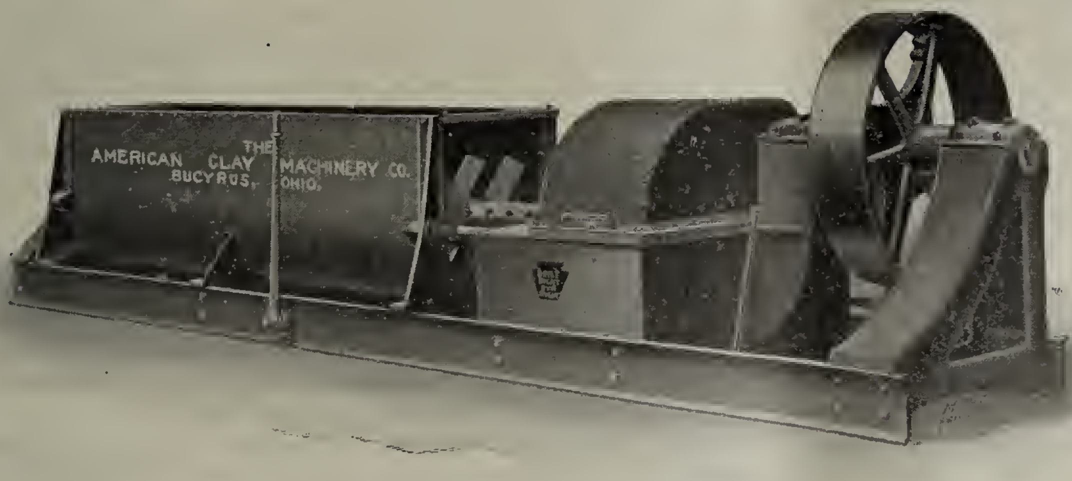
American 9 Foot Dry Pan.

PUG PERFECTION

There isn't any short cut to perfection in Pug Mills. We have been studying and perfecting clayworking machinery for over half a century and feel that our knowledge has reduced your pug mill troubles to the minimum. Our line of Pug Mills is so complete that you can get the very best and most satisfacfactory mill for your particular clay and condition.

Let us send you our Pug Mill Bulletin showing the American Line of Pug Mills and the specifications on which they are built.

Large or small clay plant wants given equally prompt attention



American No. 291 Pug Mill.

The American Clay Machinery Co., Bucyrus, Ohio, U. S. A.

World's Largest Manufacturers of Clayworking Machinery.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE BUILDING SITUATION in California shows a vastly more stable condition this month than last, when labor troubles in connection with the diggers and stevedores' strike threatened a complete tie-up of the building trades. The longshoremen have now resumed work pending final settlements as to wages and working conditions, and the outlook is fair for industrial peace. The housesmiths' union in San Francisco is on strike for shorter hours and the bricklayers of Sacramento are asking for more money, but no trouble on a large scale seems likely for the present. The clay products people suffered considerably during the longshoremen's strike by reason of shipping delays and obstacles, and now they are somewhat hampered by a car shortage on the railroads. There is a certain rush of work on buildings where the strike affected the delivery of materials and it is expected that much new construction work will be commenced this month, especially on building of secondary importance which can be completed before the rainy season.

The manufacturers of common brick are enjoying the liveliest business of any in the coast clay products industry just now. The price of common brick holds firm at $10 per thousand in San Francisco and $8.50 at the yards. Judging by present indications, this may yet be a banner year in the common brick department. All the yards are operating full force, practically, and the manufacturers have vast quantities of brick still to deliver this season. The face brick situation is very fair, but not quite as hopeful as was promised two months ago. It would seem, however, that the demand for face brick must pick up materially this month. The terra cotta business is good and shows an improvement over last year, but it is not what it should be. The terra cotta manufacturers complain of a lack of important contracts, yet admit of large numbers of small contracts. The amount of terra cotta used for ornamental purposes purely is very large in the aggregate. Tiles of the interlocking type is very popular for school house construction, residences of the better class and all sorts of business and apartment blocks of only a few stories in height. Terra cotta garden pottery has sold exceedingly well this summer.

Vitrified sewer pipe is active and the demand has been increasing with each succeeding summer month. Sanitary sewer construction work in the interior communities is in full swing and some new work of importance is being started. The export business in sewer pipe is rather heavy. Vitrified pipe for the Hawaiian Islands is being shipped in large quantities to material dealers in Honolulu. All sorts of clay products are in better demand in the islands than formerly.

The paving brick situation is looking up some, especially in the country districts. In San Mateo and Santa Clara counties there are many new roads being paved with brick and in San Francisco and Oakland brick pavements are becoming quite common in some sections. Fire brick makers are very busy, most of the coast concerns having all the business they can comfortably handle. In the Northwest the manufacturers come into competition with the Canadian fire brick, which keeps prices uncomfortably low. The demand for the best grade of fire brick is always about up to the supply in California.

N. Clark & Sons have completed terra cotta and face brick deliveries on several big contracts and have been awarded the contract for supplying the terra cotta for a new bank building at Napa, Cal.

The Funsten Clay Products Co. is the name of a new building material concern recently established in San Francisco. J. J. Funsten is the general manager, and offices have been opened in the Sharon building, where a full sample line of various brick, interlocking tile, terra cotta products and other materials are on display. The company caters to the general trade. Mr. Funsten was with N. Clark & Sons for a number of years and has had a wide experience in merchandising clay products on the Pacific coast.

The McNear Brick Agency report business pretty heavy, with 5,000,000 common brick yet to deliver on their jobs. The company is now able to make prompt deliveries by water, but a car shortage hampers deliveries by rail to a certain extent.

Gladding, McBean & Co. have been awarded the contract for supplying interlocking tile for the walls, and terra cotta and face brick for the exterior finish, of the John Breuner furniture store building being erected in Oakland. This company has practically dismantled the plant of the Carnegie company, which they purchased some months ago, and the bulk of the machinery and materials have been disposed of. The twenty-five kiln setters and wheelers employed about the pottery at Lincoln, Cal., who went on strike July 25 to enforce their demand for a raise of 25 cents a day, have been discharged and no further labor trouble is expected. The laborers were receiving $2.00 a day.

The Steiger Terra Cotta & Pottery Co. were greatly inconvenienced in shipping their products during the dock laborers' strike, but now are making up for delays. This company is shipping large consignments of vitrified sewer pipe to Honolulu. In connection with the new terra cotta product of the Steiger company, the "Thru-and-Thru" colored terra cotta, the concern is figuring on an important job for facing a concrete building with the product. This terra cotta product is adapted for high-class facing and can be used in place of marble with fine effect. Thin slabs of small size are designed for this class of work.

The Pacific Coast Pottery & Terra Co., of San Jose, is having a very fair sewer pipe business this season in the Santa Clara valley.

The Peterson-Kartschoke Company, of San Jose, is adding a tile manufacturing department to the brick plant. Machinery has been installed for making high-grade tile of different styles.

The stockholders of the Silica Brick Co., at Sacramento, have signified their intention to resume operations. New capital has been interested in the concern and it is planned to manufacture on an extensive scale. The plant was started several years ago, but was compelled to discontinue operations after the first year by reason of hard times in the building trade. The plant is to be rehabilitated.

The Western States Porcelain Co., at Richmond, Cal., will shortly begin the erection of a large grinding plant to prepare material for manufacture. The Pacific Co. recently bought control of the stock of the Western States and it is reported that plans have been formulated to establish both plants on the site of the latter.

Joseph Simons, of the Simons Brick Co., of Los Angeles, has sold out his interests in the company to his brother, Walter R. Simons, of Pasadena, Cal. This transfer of property amounts to about a quarter of a million dollars in value and leaves the purchaser in control of the concern.

Excavation work has commenced for the twelve-story building to be erected at Second and Market streets, San Francisco, by John Drum. The exterior of the building will be of pressed brick trimmed with terra cotta. The cost will approximate $175,000 and the building will be occupied chiefly by the offices of the Santa Fe Railroad.

Plans for a trunk sewer system to drain a large area south of the new Twin Peaks tunnel have been prepared and bids will be called shortly for the construction work. The sewer will start near the south portal and connect with Sloat boulevard at Twenty-fourth avenue. The cost is estimated at $60,000.

The delinquent sale in connection with the affairs of the Holland Sandstone Brick Co., of San Francisco, has been advertised for noon, August 22, 1916. The works of the plant are at Antioch, Contra Costa county, Cal.

The San Bernardino Brick Co., a new concern in San Bernardino, Cal., has filed a protest with the board of supervisors relative to the use of sand lime brick in the proposed county hospital structure, asking that burnt brick be used for the interior rather than sand lime brick all the way. The board may order a change in the plans to accord with the suggestion.

SUNSET.

San Francisco, Aug. 5.

Illustration shows how Barrett's Paving Pitch clings to the block after many years of use.

Barrett's PAVING PITCH

Every Joint an Expansion Joint

BLOCK paving of every kind requires something to fill the joints. This filler must accomplish a number of purposes. It must be:

Waterproof—so that the foundation is fully protected against water and frost action.

Plastic—so that all joints will be perfectly filled.

Elastic—so that after expansion and contraction of the pavement the filler still fills the joints.

Permanent—so that the filler lasts as long as the pavement.

Removable—so that openings may be made in the pavement without injury to the individual blocks.

Replaceable—so that the original blocks may be replaced and the filler renewed to match the old pavement.

Sanitary—so that the pavement affords no permanent lodging for filth and may be easily cleaned.

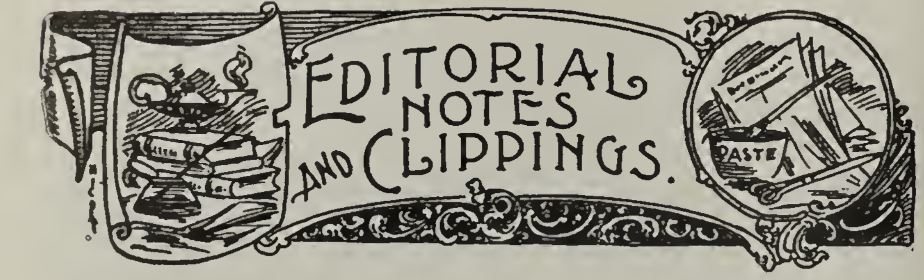
Quick Setting—so that the pavement may be used immediately both in the beginning and after repairs.

Barrett's Paving Pitch meets all these requirements. Special pitches are made to meet special conditions. A letter to our nearest office will bring the fullest information of all the latest developments.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

TRADE B MARK



EDITORIAL NOTES AND CLIPPINGS.

Wm. A. Burr is interested in a plan to establish a brickmaking plant at Gillham, Ark.

The Titus Clay Products Co., of Columbia, S. C., is building a large addition to its plant.

The Monroeville Clay Products Co. is planning the erection of a new plant at Monroeville, Ohio.

Frederick Kepler, a pioneer drain tile manufacturer of Mason County, Ill., died at his home in Warrensburg, Ill., recently.

Fire of unknown origin almost completely destroyed the brickyard of J. J. Snyder at Lima, Ohio. The damage is estimated at $6,000 by Mr. Snyder.

Amos Bird, for a number of years associated with North & Frazier, tile manufacturers of Bluffton, Ind., has resigned and will start a small tile factory at Tocsin, Ind.

The Donnelly Brick Company of Berlin, Conn., sustained a $500 loss when a small building used by them as sleeping quarters for their employes was destroyed by fire recently.

The Kansas City Brick Company, Kansas City, Mo., incorporated in Kansas, has been given permission to use its $40,000 capital in Missouri in equipping and operating a plant.

John I. Fluke, Jr., of Norwood, has acquired an interest in the new Montgomery Shale Brick Company of West Point, Pa., which has a plant capable of producing 6,000,000 bricks a year.

Robert Goodwin, who for a number of years has been superintendent of the brick plant at the Asylum for Inebriates at Knoxville, Iowa, has organized a company for the manufacture of clay products at that place.

The Andrew Ramsey Company, of Mt. Savage, Md., manufacturers of fire brick, has been incorporated with $150,000 capital stock. The incorporators are Andrew Ramsey, J. J. Gardner, Harry A. Pitzer, Henry Shriver and Guy Harrison.

Fire, which started from an overheated kiln at the brickyard of E. E. Flurrie, New Cumberland, W. Va., caused considerable damage. The firemen luckily were able to confine the flames to the kiln sheds, and the rest of the plant escaped injury.

The Architectural Tile Company, Keyport, N. J., has been incorporated with a capital of $150,000, to manufacture and deal in ceramics, bricks, tiles, etc.; incorporators, Anthony W. Cristiani, Mabel R. Cristiani, Keyport; Osgood R. Hungerford, New York City.

T. Hansen, L. S. Fanning and others are interested in a new tile factory which is to be started at Oakdale, Ore. There is a strong demand for drain tile in that section, owing to the fact that the farmers experienced great difficulty last spring with wet land.

The McFeely Brick Company and the Vulcan Refractories Company have been consolidated under the name of the former concern. The new corporation will have a capital of $160,000. The officers are F. B. McFeely, Latrobe, president; J. H. McFeely, Pittsburgh, secretary.

James S. Hayward, part owner and superintendent of the Brazil Hollow Brick and Tile Company, Brazil, Ind., died at his home in that city August 4, following a long illness. Mr. Hayward had been connected with the Brazil Company for many years. He leaves a widow and four children.

The consolidation of the Arkansas Brick and Manufacturing Company's plant, southwest of Little Rock, and the Clark Pressed Brick Company's plant at Malvern, under the same management is one of the purposes of the Arkansas Brick and Tile Company, incorporated in Little Rock recently, according to W. A. Hicks, one of the corporators. Other corporators are: John Cochran, M. H. Long, F. S. Wellman and J. H. Dillard. The company is capitalized at $300,000. The new company will improve both plants and will increase the variety of products made. It will also enlarge the tile-making machinery at the Little Rock plant, now operated by W. W. Dickinson. Mr. Dickinson probably will be one of the stockholders and officers of the new company.

The Glasgow Clay Products Company of Glasgow, Va., was incorporated recently with $100,000 capital stock.

The plant of the Greenwood Pottery Company at Trenton, N. J., was almost completely destroyed by fire the latter part of July. The loss is estimated at $75,000.

Extensive additions are being made to the plant of the Louisville Fire Brick Company at Grahn, Ky., including an additional boiler, brick machine, grinding pans and a dry blower.

Thomas Allen Taylor sued the Hillenbrand Brick Company for $2,730 damages, alleging he was injured while working at defendant's yards as the result of a huge pile of sand falling on him.

Henry I. Ackerman, brick manufacturer, of Morton, died of hardening of the arteries. He was fifty-nine years old and had been in business in Morton twenty-three years. He is survived by his widow, four daughters and two sons.

Mifflin-Hood Pottery & Clay Products Company is building a new plant at Daisy, Tenn., for the purpose of manufacturing shale acid rings from the shale found in that section. C. L. Krager will be vice-president and general manager of the new industry.

The Savannah Brick Company, the successor of the old Georgia Red Brick Company, at Savannah, Ga., has overhauled the plant, which has been idle for some time, and is now turning out 40,000 brick per day. Irving A. Rittenberg is in charge of the plant.

Certificates of incorporation for the Apollo Refractories Company of West Apollo, Pa., has been filed. Incorporators are W. A. McGeary, E. A. McKeever, S. A. McKeever, C. R. Stewart, all of Johnstown. Company is capitalized at $10,000 and will manufacture all kinds of clay brick.

Leslie C. Pierson, president of the New Jersey China Clay Company, Trenton, N. J., died suddenly from heart disease. Mr. Pierson was prominent in the business and civic affairs of Trenton, and at the time of his death was serving as Chief Clerk of the New Jersey Supreme Court. A wife, one son and one daughter survive.

The Marshfield Brick & Tile Company has started a new plant at Marshfield, Wis., for the manufacture of building brick and tile and drain tile. The plant has a capacity of 40,000 brick per day. This plant was started as a result of experiments conducted by the mining department of the University of Wisconsin showing the valuable proprieties of Wisconsin clay.

With the recording of deeds to eighty acres of land by Henry C. Kleymeyer and others recently the consolidation of the Evansville Brick & Tile Company and the Standard Brick Company under the latter name was perfected at Evansville, Ind. Some time ago the capital stock of the Standard Brick Company was doubled to make this consolidation and improvements possible.

The Gladding-McBean Pottery Company of Los Angeles, Cal., sustained a $20,000 loss when a large barn containing eighteen horses and a tool shed on their plant at Lincoln, Cal., was burned to the ground. The barn was a frame structure, in which was stored seventy-five tons of hay and the flames spread so rapidly that only one horse was saved. The factory buildings are all fireproof and consequently were unharmed.

The convention of the National Brotherhood of Operative Potters made short work of a resolution which provided that sufficient funds be taken from the defense fund to build a pottery, same to be located in that part of the country offering the best inducements in the way of "bonus, fuel and freight rates."

One delegate said: "The organization has trouble enough of its own, without going out of its way to borrow more trouble."

Carrying out a policy of always looking after the best interest of its employes, the Shawmut Clay Manufacturing Company, which operates a large sewer pipe and conduit factory at Drummond, Pa., has announced another raise in wages to all employes of the plant, the raise being effective August 1. This is the second raise voluntarily given the men of this plant this summer by the company, both increases amounting to about 20 per cent. The employes of the plant are naturally elated over the thoughtfulness of Manager Stacy E. Tuttle.

(Continued on page 180.)

THINK!!!

of

THE UNDERWOOD PRODUCER GAS BURNING SYSTEM
PATENTED

THE JUSTICE CLAY PRODUCTS DRYERS
PATENTED

THE MECO SINGLE ROLL ROCK AND SHALE CRUSHER

Then

ACT!!!

By Investigating.

The Manufacturers Equipment Co.
Dayton, Ohio, U. S. A.
Western Agent: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

Mention THE CLAY-WORKER.

EDITORIAL NOTES AND CLIPPINGS—Continued.

The company employs over 100 men in its various departments.

Jacob Jonesch, an employe of the Laclede-Christy Clay Products Company, St. Louis, Mo., was caught in a fall of clay following blasting in the mine and severely injured.

The Stevens Point Brick Company, Stevens Point, Wis., was recently awarded, in addition to many other contracts, a 160,000 brick contract for the Odgenburg (Wis.) school building.

The Chewelah Brick & Tile Company is constructing an immense new kiln at their plant at Chewelah, Washington. With the completion of the kiln the plant will have a daily capacity of 35,000 brick.

The Jefferson Brick and Tile Company, Jefferson, Wis., is being rushed with orders, due to the large amount of building going on in that and surrounding cities. The output is curtailed to some degree by the acute lack of laborers.

The County Commissioners of Norristown, Pa., have under way plans for the erection of a paving brick manufacturing plant to be operated by the prisoners of the county jail, the products of which will be used for the construction of county roads.

Francis Swaty, aged ninety-four years, for many years a prominent business man of Algoma, Wis., died at his home in the town of Ahnapee, Wis., recently. He was credited as having been the first manufacturer of building brick at Algoma.

The American Clay Company of West Terre Haute, Ind., is making a number of improvements in its plant, including the addition of ten new chambers to the continuous kiln. The work is under the direction of C. W. Flagg, the superintendent of the plant.

Mrs. Belle Stull, of Mineral City, Mo., has filed suit against George J. Markley and the Holden Clay Products Company for $2,000 damages, claiming that the defendants caused water from a coal mine to flow through one of her fields and damage a stream of clear, pure water.

The Bay City Clay Products Company of Bay City, Texas, has been incorporated by J. W. Ridgely and Charles H. Le Gendre. The company now has a plant in operation manufacturing brick, drain tile and hollow building tile and silo blocks, and will materially increase the capacity of the factory.

The Ridgway Brick Company of Watsontown, Pa., has taken over the plant of the Keystone Brick Co., and will commence at once the erection of new kilns, which will increase the capacity of the plant at least 25 per cent. In addition to paving and building brick the concern will make hollow tile.

Construction work has been started to repair the damage at the brickyards of Zerrenner Bros., at New London, Wis., caused by the recent fire. The brick kilns were damaged. The company is enjoying a brisk business. In three days recently, nine cars of brick were shipped, each consigned to a different concern.

Incorporation papers have been filed by the Cafmeyer Bros. Tile Company, of Milwaukee, Wis. Offices and display rooms have been opened at 452 Milwaukee street, where a complete line of wall, floor and fireplace brick is displayed. H. N. Cafmeyer is president of the company, and E. J. Cafmeyer, secretary and treasurer. The capital stock is $7,500.

An application for a charter for the Stevens Fire Brick Co., of Macon, Ga., has been made by W. C. Stevens and W. Stapler, incorporators, to succeed Stevens Bros. Co., whose plant was burned some time since. The object of the company organization is to deal in fire brick. Capitalization at the beginning of operation shall be $5,000, with privilege of increasing to $250,000. The charter is to run for twenty years.

The Washington Brick, Lime & Sewer Pipe Company, Spokane, Wash., are somewhat elated over a contract which they have just closed with the Alaska Engineering Company for 30,000 fire brick, to be used by the government in a department of the Alaska Railway, now under construction. The government engineers expressed doubt as to the availability of the Spokane product, but it stood all the tests made in a highly gratifying manner. In addition to the above, Mr. J. B. Watson, superintendent of the company, writes they have recently booked an order for 114,000 of their matt brick for Missoula, Mont., and 70,000 to be shipped to Kellog, Idaho.

Hand Clay Company of Canton, N. C., has been incorporated, with authorized capital stock of $5,000. The incorporators are C. Hand, J. M. Hand and V. H. Visscher.

The plant of the Glen-Gery Brick Company at Wyomissing, Pa., started operations recently with an entirely new equipment. The plant has an output of 90,000 brick per day.

The plant of the Virginia Brick Company of Suffolk, Va., which is owned by Butler Brothers of East Suffolk, Va., was damaged to the extent of $2,500 by fire in the boiler room and dry sheds.

The Milwaukee Pottery Company has been incorporated in Milwaukee, Wis., with a capital stock of $15,000. The incorporators are Henry P. Schuette, Louis P. Weis and Anna Schuette.

John Richardson, for about thirty years an importer of china clays from England to Boston, died at his home in Cohasset, Mass., July 30. He was treasurer of John Richardson Company, clay importers.

The Rappahannock Brick Corporation of Richmond, Va., has been incorporated with $40,000 stock. The officers of the company are J. V. Talley, president; R. H. Walker, vice-president; John H. Bocock, secretary and treasurer, all of Richmond.

The Texas Clay Products Company of Malakoff, Texas, has been sold to Hawood & Williams Company of St. Louis, Mo., for something over $150,000. The plant will be materially enlarged, and in addition to building brick will turn out sewer pipe and drain tile.

Orders are plentiful at the Marshfield Brick and Tile Company, Marshfield, Wis. Home-made brick will be used in the construction of the new Sacred Heart church and school in that city, the brick company having secured a contract for 500,000 brick on this job.

The Key-James Brick Company of Chattanooga, Tenn., recently shipped several car loads of their brick known as their Key-James Rough Texture shale brick, to Madison, Wis. The company has made a number of shipments to Cincinnati and adjacent territory, but this is the first time they have shipped their product so far north.

Conrad Gmeiner, proprietor of the brickyards at Waupaca, Wis., has recently installed new equipment. A new kiln, with a capacity of 85,000 bricks, has been installed to replace the old time kiln, and two more will be erected shortly. Machinery for the manufacture of tile, sewer pipe and other clay products will also be installed.

The Clydesdale Brick & Clay Company of Pittsburgh, Pa., with a new plant at Elwood, Pa., has become a licensee of the Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio. H. J. Orth is president of the Clydesdale Company and W. W. Cunningham vice-president and general manager. The Clydesdale plant at Elwood will have a daily capacity of 100,000 paving brick. It is the intention of the company to double the plant's capacity in the near future.

The Smith Brick Company of Omaha, Neb., will move the present yards to another part of the city on account of complaints from the residents adjacent to the plant of smoke, etc. Work has begun on the new plant and same will be pushed to completion as rapidly as possible and in a manner that will not interfere with the operation of the present plant, for the company has many orders on hand.

A fine display of sixteen varieties of brick handled by the M. B. Helmer Milling Company, of Fond du Lac, Wis., is made in the construction of panels in the offices of the concern. This concern is nearly half a century old, and its business covers this and adjoining states. Recently new offices were erected at 184-196 Second street. One of the interesting sights is the fireplace built of Alliance rug brick, installed in Mr. M. B. Helmer's private office.

James B. Crowell, a well-known business man of Walkill, N. Y., died at his home in that city July 31. Mr. Crowell began the manufacture of brick moulds in 1872, which he continued until his death. Notwithstanding the fact that his factory had been destroyed by fire three times, he had built up an extensive business, which wil be continued by his son, J. Addison Crowell, under the firm name of James B. Crowell & Son. Mr. Crowell was well known throughout the brick-making fraternity, and had been a member of the National Brick Manufacturers' Association for many years. A wife, one son and three daughters survive.

JUNCTION CITY BRICK PLANT WILL FURNISH BRICKS FOR STATE HIGHWAY AND STATE INSTITUTIONS.

The use of brick made by prisoners at the Junction City, Ohio, brick plant on the state highway has enabled the board of administration to resume making paving brick. About 100 prisoners are now employed at the plant, but because of the extremely hot weather they are only being compelled to work half time. Building brick to be used in the erection of additions to state institutions amounting to more than 3,000,000, have just been completed by the prisoners working at Junction City.

STOCKHOLDERS OF BRICK COMPANY ASK FOR A RECEIVER.

Alleging that the control of the corporation has been so maneuvered that it is now vested in parties residing outside the state, and despite the objections and protests of minority stockholders, a determined, willful effort is now being made to wreck the company, S. Esther Burgess, Walter L. Anthony, W. L. Topley, Nan J. Elder, Margaret B. Becket, James N. Davidson and Olie A. Peart, as minority stockholders, instituted equity proceedings in the United States District Court at Pittsburgh recently against the Kittanning Face Brick Company, a corporation existing under the laws of New York, Edward H. Crandall, president; Charles J. Henderson, vice president; W. P. Brown, treasurer; Joseph A. Riley, secretary, and Edward H. Crandall, Charles J. Henderson, Joseph A. Riley, William Reinerth, Jr., William Reese, E. R. Leonard and W. P. Brown, directors.

The court is asked in the bill to require the return to the company treasury of 135 shares of stock in the company alleged to have been illegally taken out by Edward H. Crandall, the president, and to appoint a temporary receiver to conserve the property and the interest of all the stockholders. Gross mismanagement of the company's affairs is alleged.

UTILIZING WASTE PRODUCTS.

The slag banks of Great Britain are being diminished and the waste of iron manufacture turned to profitable account, following the example of Germany. The art of making brick from this waste that could not practically be put out of existence and that yet refused to yield itself to practical use has dawned upon man's vision, and the knowledge has crept into the iron manufacturing section of England and Wales. A plant is in successful operation in South Wales, and one is in process of construction in the Cleator Moor region of England. Moreover, brick is not to be the only product of the newly developed slag-working processes. The tar macadam that motor traffic is calling more and more into road construction is being coaxed out of broken slag, and a molded slag block for pavement making is still another form of utilization of what has heretofore been a peculiarly difficult form of waste to cope with. Its very presence in constantly growing unsightly landscape-defacing masses has doubtless been a spur to scientific ingenuity in coping with it—but all the while the economic sense has been developing, too, to a realization that refuse has been allowed to too great an extent to be waste, when in reality it contained the essentials of a valuable new product. With slag turned to account, the hope grows of a day when there will be no industrial waste—a day of supreme technical ingenuity and economic thrift. That will be a day of prosperity indeed.—Exchange.

CHICAGO KILN BUILDER HAS LARGE CONTRACT.

Claude Smith Company, kiln builders of Chicago, is building kilns for the Nicholson Clay Manufacturing Company at Ray, Ill. A large force of men are at work and rapid progress is being made in order to get an early start.

Why You Should Try GANDY

THERE are thousands and thousands of GANDY belts giving service in practically every kind of belt duty.

A large proportion of them were originally purchased to replace leather or rubber, which they did most effectively.

GANDY Belts give equal or larger service than other belts, and cost less than rubber or leather, which should warrant your giving GANDY a trial in your own plant.

Once you try GANDY, the lower cost, greater wear, efficient service, oil-water-heat-dust- and gas-proof features, all of which you will find are a part of GANDY service, will cause you to continue its use, just as thousands of other satisfied users have.

If you have a place where you will soon need a new belt, try a Gandy there. Write us for samples and prices.

Gandy Belting Company
749 W. Pratt St.
Baltimore, Md.

New York Branch, 36 Warren Street.

MORE MONEY

There are just three ways for **YOU** to make money out of your plant.

Ask more money for the ware you are now producing—Competition won't let you—

OR

make your ware more economically. Make better ware and get the **Quality Price.**

Hook Down Draft Kilns will do **both** for you. Install Hook Kilns and get the highest possible percentage of first quality ware with less coal and in less time than with your present kilns.

Many clayworkers in different parts of the United States are already obtaining these results—So can YOU.

Don't wait until you build new kilns. Your first year's saving will pay the cost of changing your old kilns to this system.

We sell on a "Money-Back-Guarantee." We gain only when you gain.

Why not investigate this proposition NOW?

We furnish Kiln Bands & Grate Bars for All Types of Kilns.

HOOK PATENT KILN CO.

Commerce Bldg., Columbus, Ohio

Canadian Office
250 Dufferin St. Toronto, Ont., Can.

BURNING CLAY WARES.

(Continued from page 129.)

fusible and which would not slake. The segregation of the lime prevented the formation of a fusible mixture of it with the other clay ingredients.

Lime in small percentages in clay shows little effect, at least in practical operations. As the lime content increases we experience the serious fluxing difficulty, but when it becomes excessive it acts as a refractory and carries the burning over the fluxing range; or, to be consistent, a low temperature fusible mixture is impossible with such excess of lime.

A marked feature of lime is the color produced. A clay containing sufficient iron to burn red will, when impregnated with lime, burn to a buff, changing at higher temperatures to a yellow-green and finally to a decided green. At very low temperatures, before the lime enters into the fusible mixture in any effective degree, the color of the ware is red. The red color is due to the iron, and disappears when the iron begins to combine with the lime and silica as a lime-iron-silicate, while the final green color is due to a full development of the lime iron body. The color and its mutations are characteristic of a limey clay.

A limey clay seldom produces a pleasing face building color. While red, buff and green are satisfactory building colors, limey clays are not satisfactory, in that we cannot produce any uniformity of color, and the result is motley effect in the wall.

Particularly is this true in continuous kilns where the product will be red streaked with buff, and vice versa.

There is a large excess of air in a continuous kiln, and the kiln atmosphere is as nearly oxidizing all the time as is possible in any kiln. Ferric oxide, which is red and gives the color to red wares, does not enter into chemical combination in the ferric state, at least not with lime, and the effect of the kiln atmosphere is to maintain this ferric condition.

It is a contest between the oxidizing kiln atmosphere and the dissociating influence of a fusible mixture.

As the temperature advances the oxidizing conditions are weakened, and the effect of the fusible mixture strengthened; but in many instances the fusion does not go far enough to fully include the iron, and in consequence the streakiness of the product is more marked in a continuous kiln. It is possible to overcome this effect by dampering the kiln and thus produce a reducing condition in the kiln atmosphere, which reduces the iron and puts it in condition to combine readily with the lime and silica.

The usual effect of a limey clay product in a wall is that of a ware that has been coated with mortar and then cleaned with a scraper or skutch.

There are exceptions, however, and we have seen excellent buff and green wares sorted from limey clay products; nor must the pale red products be overlooked.

In the latter the lime mixture absorbs only part of the iron, or possibly some mixture other than lime develops the bond at a lower temperature than that of the lime eutetic, and the iron only partially enters into this other mixture. Clay is too complex to draw any conclusions, except in regard to very pronounced phenomena.

Gypsum (lime sulphate), as has been noted, is of frequent occurrence in clays and also that it dissociates at a higher temperature than lime carbonate. The dissociation begins below 1800° F., but becomes very rapid about this temperature and up to 2000° F.

Limey clay products in the burning frequently begin to fail at about cone 02 (2030° F.), and in consequence the burning is done at a lower temperature than this.

We have seen in limey clay products crackled surfaces, especially where the ware has been exposed to the flame around the bag. This may be due to increased shrinkage under exposure to flame temperature; but, the ware not being deformed, the exposure to such flame temperature must have been only for short periods, however many times it may have been repeated.

It is not unlikely that the scum on the surface of the ware, being reduced as it usually is around the bags of a kiln, introduces additional flux into the surface layers, causing largely increased shrinkage, and that the crackling is due to this rather than the general effect of the fusible mixture in the body of the ware.

(To be continued.)

Written for the Clay-Worker.

BRICK AND CLAY NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

BUILDING IS AT A LET-UP at this time of the year, always, as the harvest is at hand, which draws laborers away from the cities, and also the outcome of the harvest has everything to do with the prospects for business for fall and winter. Hence, there is not a great deal of new building work in prospect at this time, any year. This season has an unfortunate condition to face. The wheat crop of the Northwest has been sorely damaged by black rust and blight. The crop has been cut down to perhaps 60 or 70 per cent. of the normal crop and possibly half of last year's extra heavy yield. This will mean deferring building many proposed buildings until later, possibly another season. However, it is not as though the section were dependent upon a one-crop proposition. Other grains, including corn, barley, oats, rye and flax, are doing well, so that the Northwest will be in comfortable condition, despite the untoward situation of wheat.

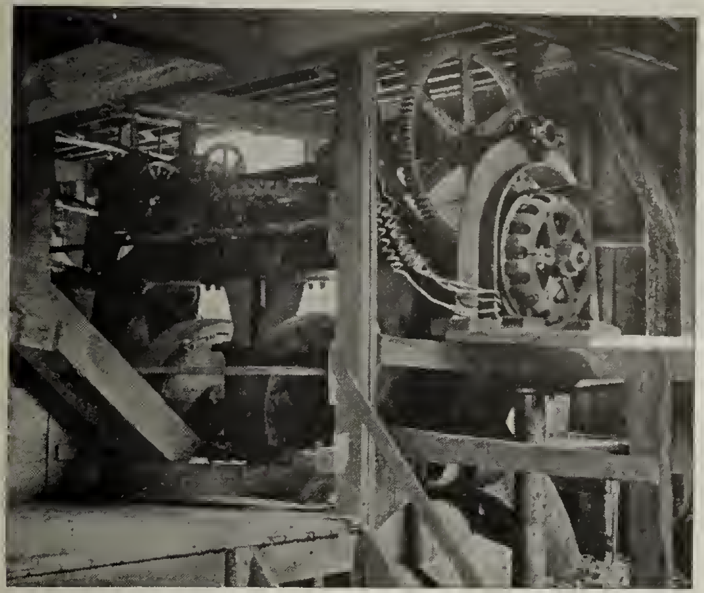
The forthcoming Minnesota State Fair, which holds its exhibition the first week in September, will have the biggest display of building materials in its history. A special effort has been made to offer an unusually attractive display of building materials. Tests are to be reported on different materials and everything will be done to make the display of value. A number of different lines of building materials have displays at the fair, and among them are a number of clay and tile displays, which are growing in interest and importance year by year. With the increased interest which is being shown in the use of clay, due to wider publicity work, and the good work done by the Northwestern Clay Association on its competition under the auspices of the Minnesota Art Commission. there is no doubt that the 1916 fair will be unusually interesting.

Minneapolis is having another furore over the question of paving arterial roads leading from the outskirts to the center of the city. Experiments with various compositions and concrete are proposed, with the knowledge that all of these have proved to be an unfortunate and unsafe choice elsewhere. Brick is the real paving material, but the first cost of the lesser materials proves attractive enough to overshadow the better wares. A striking example of the uncertainty of the various substitutes is shown in the condition of Lyndale Avenue South, which is a theoretically paved street, with an oil-mixture composition, which is so poor that automobile traffic has rendered it a series of billows and humps. The unfortunate taxpayers have paid for paving the street once and are now facing the probability of another assessment for another pavement.

The Builders' Exchange of Minneapolis has formed a holding company which will proceed with the erection of an office building at 613-617 Second Avenue South to house the exchange, with office rooms for building material firms of all sorts. A committee which included some of the prominent general contractors of the city arranged the preliminaries.

A zoning commission for Minneapolis is proposed to ar-

(Continued on next page.)



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Do you drive a long line shaft to operate a single machine? If so, you are paying power bills for nothing.

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will enable you to increase your output—save transmission losses—prevents a tieup from line shaft bearing trouble.

It will pay to investigate the possibilities of motor drive.

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DU PONT

EXPLOSIVES

Are the Most Efficient and Economical Aids for Mining Shale and Clay

IT is essential to the operators of clay pits and shale beds that they mine their raw products at the lowest possible cost. This can be accomplished by the rational use of Du Pont Explosives. Adopting blasting methods will facilitate your work and reduce cost of production.

We have prepared a valuable booklet descriptive of practical blasting methods for clay mining, draining clay pits, blasting down shale, etc.

ADOPT THE NEW WAY TO MINE YOUR CLAY

Write today and ask for Clay Blasting Booklet No. 296.

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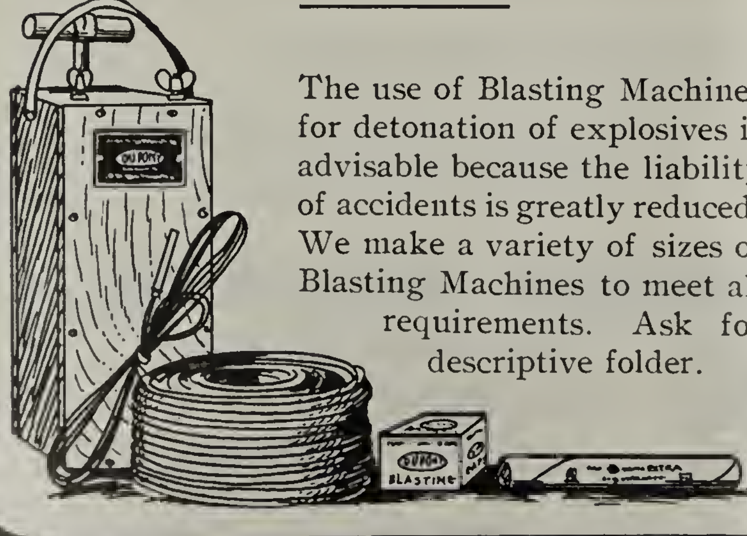
WILMINGTON, DELAWARE



The use of Blasting Machines for detonation of explosives is advisable because the liability of accidents is greatly reduced. We make a variety of sizes of Blasting Machines to meet all requirements. Ask for descriptive folder.

range the city into zones, in which the character of buildings shall be determined, thus limiting factories, stores and mercantile establishments to certain sections. This will add to the permanency of a section and will encourage the construction of better buildings, which means more brick and clay materials used.

The J. & W. A. Elliott Company, of Minneapolis, received the general contract to erect a brick warehouse on Washington and Sixth avenues North for the International Harvester Company. Cost about $200,000. It will be eight stories—126 x 162.

The Madsen Construction Company, Plymouth Building, Minneapolis, received the contract to erect a high and grade school building at Red Wing, Minn., to cost about $120,000.

Bethany Norwegian Lutheran Church of South Minneapolis has had plans prepared by Peter O. Moe, architect, Minneapolis, for a modern brick church 60 x 100.

St. Joseph's Hospital, St. Paul, will erect a large brick building to cost $300,000. C. H. Johnston, of St. Paul, is the architect.

The Harwood Hotel Company, Minneapolis, has had plans prepared for a six-story brick hotel building to be erected at 216-218 South Third street with walls to carry six additional stories.

Messiah Evangelical Lutheran Church of South Minneapolis is having plans prepared for a solid brick church to be erected at Twenty-fifth street and Columbus avenue. Cost $30,000.

E. L. Masqueray, architect, St. Paul, is preparing plans for a brick and stone church for the Church of the Incarnation (Roman Catholic) of Minneapolis, to cost $100,000.

T. WIN.

NEW YORK AND VICINITY.

Ask the average North River brick manufacturer about his business and he will tell you the selling end is good but the manufacturing end is uncertain and keeps him worried. He has trouble getting help, and when he gets the help and succeeds in getting his brick made he has further difficulty in getting it shipped. Cars are hard to obtain and towboats have become so costly of late that the expense of getting brick down the river by water is almost as great as getting it down by rail, unless a firm happens to own its towing fleet, and then it is worth so much more for other purposes that it can scarcely bring down its own barges. Brick are selling as high as $8.75, though in some instances twenty-five cents under will buy. And the yards can't begin to fill their orders.

At last the building code has limited the height of buildings in New York City, and nothing exceeding 157 feet will be allowed. Or, to state it another way, the building can be only as high as the street on which it stands. Skyscrapers are therefore prohibited, and hereafter those who want more room than buildings of that height will afford will have to go across to New Jersey or out on Long Island. BURTON.

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

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BOSS TEN-HOUR DRYER

Dries Easily the Most Tender Clays.
No Live Steam---No Drying at Night.

BOSS SYSTEM of BURNING BRICK

Use the Cheapest Slack Coal or Screenings
and Cut Your Fuel Bill in Half.

Write for Catalogs.

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Drop a line to

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Lock Box 269, OTTAWA, ILL.

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5000 Brick and Tile Manufacturers

who are willing to be shown how to save Time, Labor and Fuel (some makers say 59 per cent) by using

HOOK'S IMPROVED
UP AND DOWN-DRAFT KILN
Uniform Clay Burning System.

We have a "Grateless Furnace Dry Kiln," cheap and economical to build and operate, Also low prices on Fire Brick and Kiln Iron. Just fill out, detach and mail this

Coupon

Ohio Kiln Co., Vigo, Ohio:
Without obligation or expense "show me."
Name ....
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State ....

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Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

BRICK PLANT FOR SALE.

Part or all. For information write
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Bagley grader outfit, complete. In good running order. Will remove a pile of overburden, or very well adapted for grading. A bargain. Address
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7 2 d Care Clay-Worker.

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Brickyard, stiff mud Chambers machine, situated about 12 miles from Newport News, on navigable water; about 30 acres land; good clay. Clay makes best brick in this section. Good reasons for selling. Best sort of term. Address
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7 3 c Newport News, Va.

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In the mid-continent gas belt, a paving brick plant, one of the best built with reputation for quality worth more than the physical value. Terms which will suit anyone looking for a paying investment. Business is good, prospects better. Address
BOX 6—KANSAS,
6 3 c Care Clay-Worker.

FOR SALE.

Brick and tile plant, located at Forest Lake, Minn., 25 miles from St. Paul, on the main line of the N. P. Ry. Good opening for a man who wants to make clay or cement tile. Equipment consists of two kilns, building, three-tunnel dryer, tile or brick machine, pug mill, crusher, automatic tile cutter, 50-horse-power engine, 80-horse-power boiler, 50 double-deck dryer cars, shafting, pulleys and rails. Electric power if desired. Will sell cheap, the real estate and equipment, or separately. Address
P. C. MOLAN,
8 1 d Forest Lake, Minn.

FOR SALE.
WORTH INVESTIGATING.

Brick plant, located on P. R. R., near Emporium, Pa., with 250 acres of land, with mineral rights of additional 250 acres. An abundance of shale, coal and second-grade fire clay. Working outfit is complete, and plant can be put in operation within 30 days. Clay is suitable for manufacture of paving brick, building brick, second-grade fire brick or hollow ware. For full description of plant see ad. on page 188, this issue. For particulars address
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Cleveland, Ohio.

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Seven turntables. For particulars write
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1 new piano-wire screen.
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Second-Hand---50,000 Capacity

Now arranged for Side Cut Brick complete to end of die. New cutter required.

10-foot Pug Mill in good order.

Favorable prices.

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Common brick plant, 30,000 capacity per day, 15 miles from Cincinnati, product always oversold. Cost over $40,000, can be bought for about half. Address COMMON BRICK, care Clay-Worker.
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FOR SALE.

100-h.p., 2-cycle Burger gas engine, ready for service. Have installed electric power and have no further use for it. Inquire of
BEAVER VALLEY POT CO.,
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RECEIVER'S SALE OF BRICK PROPERTY.

The property of The Troy Press Brick Company, of Troy, Madison County, Illinois, will be sold at public auction at the front door of the postoffice in Troy, Ill., at 10 o'clock a. m., Saturday, September 9, 1916. The property consists of fifteen acres of good brick clay land and kilns and machinery for making pressed brick. Absolute title will be conveyed.
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Edwardsville, Ill.,
Attorneys for Complainants.

FOR SALE.

Plant making paving, common, face and fire brick, building block, silo and drain tile.

Abundance of best shale, clay, fire clay and coal.

Equipment complete and running.

No near competition.

In the Middle West, Mississippi valley.

Fine city for home, with State University and Colleges.

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Small amount of cash will handle it.
D. W. S.,
7 2 d Care Clay-Worker.

WANTED, ETC.

WANTED.

For immediate delivery, any lengths of gravity conveyors. State size and price to
HAL,
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WANTED.

A reliable man to take charge of machine. Must have a thorough knowledge of manufacturing hollow tile.
HORSEHEADS BRICK CO.,
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WANTED.

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Man capable of taking full charge of all machinery in brick plant making 100,000 per day. When writing give full information. Address
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WANTED.

Man to oil and attend to brickmaking machinery, dry pan and stiff mud outfit. Apply to
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A burner for a drain tile and dry pressed brick in round, down draft with horizontal grate. Easy work, night and day shift. Yellow plastic clay, burns red. Address
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One dry pan, 9 foot; one wet pan, 8 or 9 foot; one sewer pipe press. Give complete description, condition and cash price. Address, LOCK BOX 727,
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Position as superintendent of sewer pipe, fire-proofing or brick plant; 28 years in the business, 18 as kiln burner. Can handle labor and give the best of references. Address
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WANTED.

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Can design and erect various types of up-draft, down-draft and continuous kilns, also direct and waste heat dryers and complete brick and tile plants. No. 1 references. Address,
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6 tf d Care Clay-Worker.

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Indianapolis, Ind.

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MACKINAC
DETROIT, CLEVELAND BUFFALO, NIAGARA FALLS.
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Write for detailed information

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"CLAYS," Heinrich Ries	5.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M.	2.00
"PRACTICAL FARM DRAINAGE," C. G. Elliott	1.50
"ENGINEERING FOR LAND DRAINAGE," C. G. Elliott	2.00

Mailed, postage free on receipt of price.

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LOCATION—On P. R. R., near Emporium, Pa., midway between Buffalo and Pittsburgh.

PROPERTY—250 acres of land. Mineral rights of additional 250 acres.

MATERIAL—Abundance of shale, second grade fire clay and coal.

PLANT—Power house complete. Twelve good kilns. Two dry pans. Bucket elevator conveyor. Screens. Pug mill. Auger machine. Cutter. Represses. Waste belts. Ten drier tunnels. Cars. Complete industrial equipment to mines and shale pit. R. R. siding alongside kilns.

Plant now idle, could be operating in thirty days.

Paving brick, building brick, second grade fire brick or hollow ware could be manufactured economically.

Write for further information or samples of material.

L. R. WILSON Station G **Cleveland, Ohio**

Improved Belt Conveyors

For carrying all kinds of material, gritty and otherwise. Gradual, uniform curve of belt secured without complicated parts.

Bearings thoroughly lubricated and *dust-proof.* Economy and satisfaction—nothing to get out of order.

We manufacture Complete Handling Equipments.

H. W. CALDWELL & SON CO.

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GAS RETORT
AND
FIRE BRICK
WORKS

The Parker-Russell
Mining and Manufacturing Co.
ST. LOUIS, U. S. A.

**Fire Clay and Silica Products of Quality for Service---
Especially for Kiln Construction.**

Books of Interest to the Clayworker

REFRACTORIES & FURNACES, by F. T. Harvard, E. M. Price $4.

Gives much valuable information relative to the properties, preparation and application of materials used in the construction and operation of furnaces.

CERAMIC GLAZES, price $10.00.

The book is remarkable for its systematic thoroughness, no more finely arranged charts of glazes in the way of careful gradations, coupled with extensive variations, could well be imagined.

Sold by

T. A. RANDALL & CO. (Inc.). Indianapolis.

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INSURES YOUR MAIL BEING SEALED SECURELY AND NEATLY. YOUR MAIL CATCHES THE EARLY TRAIN

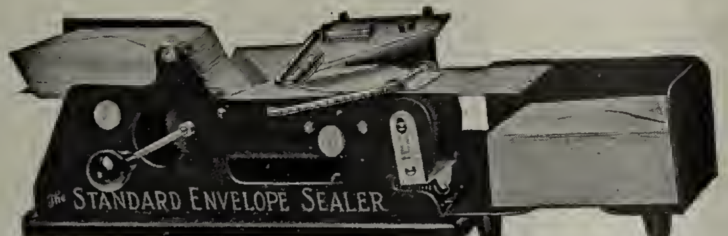


Table showing the comparative operating cost per annum between the STANDARD and any power sealer retailing at $100.00.

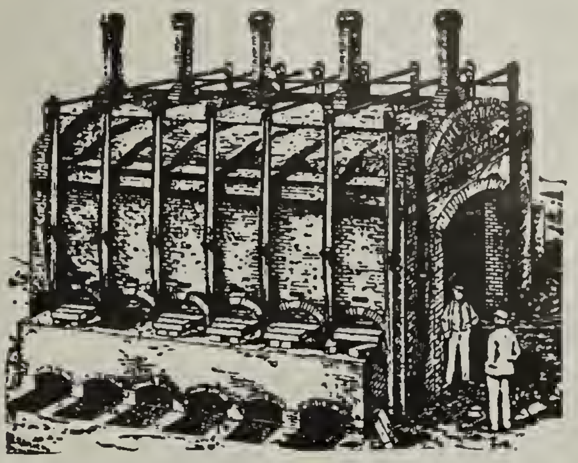
The Standard, Model F Costing $25		Any Electric Sealer Costing $100
$5.00	Depreciation based on machine becoming obsolete in 5 years	$20.00
2.50	Repairs, parts, etc., 10% of initial cost	10.00
0.00	Electricity, based on electric sealer being used only ½ hour per day at 10c per hour	15.00
1.50	Loss Of interest on investment at 6% per annum	6.00
$9.00	Total annual operating cost	$51.00

Showing a difference of $42. per annum in favor of the STANDARD, equal to nearly double its initial cost. No allowance has been made in the above table for the fact that owing to its SIMPLICITY and EASE OF OPERATION, the STANDARD can be operated by YOUR MOST INEXPERIENCED OFFICE HELP. We are anxious to prove our claims in a competitive test IN YOUR OWN OFFICE AT OUR EXPENSE.

Write for Demonstration to

UTICA SALES & SPECIALTY CO., Inc., UTICA, NEW YORK

E. SCHMATOLLA
Consulting, Designing & Constructing
Engineer and Patent Attorney
To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares.
150 Nassau St., New York, U. S. A.



The Yates Patent Down-Draft Kiln Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

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DENNIS SYSTEM OF KILNS AND DRYERS.

(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

Plans for tunnel dryers for either the car system or the Steel Pallet and Lift Car System.

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Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.

EASTON, PA., U. S. A.

Correspondence solicited.

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Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.

If...

You Want to Sell or Buy...

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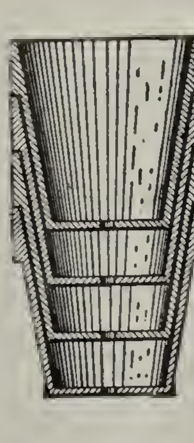
RATES

For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of seven words to line. Head line counts as two lines.



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WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;

4,000 four-inch "; 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

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New Books Which Are Being Offered To the Trade:

HOLLOW TILE HOUSE, by Fred'k Squires, Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

CEMENT, CONCRETE & BRICK, by A. B. Searle, Price, $3.00.

A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

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Builders of
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Dry and Wet
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for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

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$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) **$2.00**

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**BUFFALO—CLEVELAND
DETROIT**
Hotel Statler, ST. LOUIS, now building

Away from Home

MANY a man finds it difficult to be at his best when away from home. He is annoyed by little inconveniences, by unfamiliar surroundings which do not minister to rest and comfort, by service from people to whom he is only a buyer—and one of many.

Hotels Statler are equipped and operated with these thoughts especially in mind. Far-sighted provisions for the traveler's comfort and convenience are supplemented by a courteous, gracious, interested service.

Every patron of a Hotel Statler is an important man to us and his satisfaction is guaranteed.

Hotels Statler lobbies and public rooms are cheerful, luxurious and comfortable.

Rates from $1⁵⁰ Per Day

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450 Rooms
450 Baths

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1000 Rooms
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1000 Rooms
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**THE ROESSLER & HASSLACHER
Chemical Company
New York**

PREVENT SCUMMING
by treating your
BRICK & TERRA COTTA CLAY PRODUCTS
during process of manufacture with our
PRECIPITATED
CARBONATE BARYTES

Make Your Slogan
"SCUMPROOF PRODUCTS."
Write for literature.

BRANCHES
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HIGH GRADE
CHEMICALS
COLORS and OXIDES
for
Brick, Terra Cotta
Tile, Clay Products
Also
Pottery, Glass
And Enameled Ware

THE OREGON KILN

A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
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PYROMETERS

A Brown Pyrometer on your kilns will pay for itself in two months in the saving in fuel alone, not to mention better ware produced.

Send for 56 page Catalog No. 17

BROWN INSTRUMENT CO.
PHILADELPHIA, PA.
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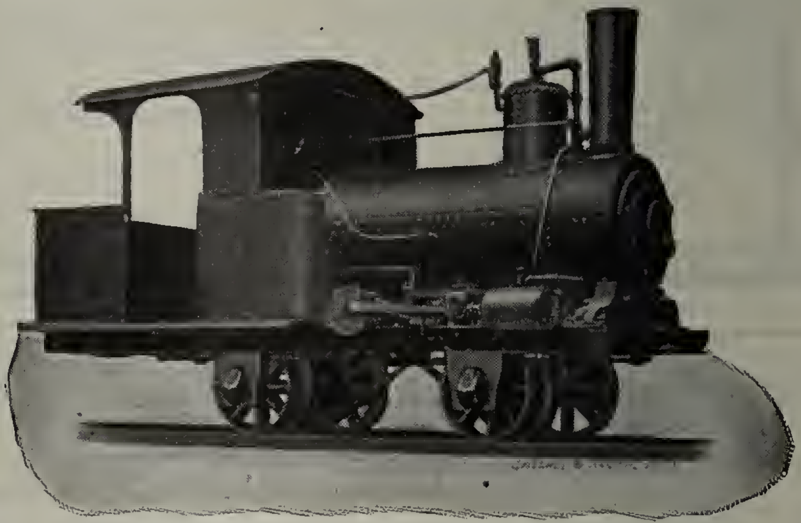
INDUSTRIAL LOCOMOTIVES

TWO SIZES
5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

NO. 1
KNOWN
THE WORLD OVER
SCHURS
OIL BURNER CO.
Los Angeles, Cal.

NOTICE!

TO
BRICK MFRS.
FOR
QUICK BURNS
AND
BETTER COLOR
BURN OIL
AND USE
SCHURS BURNERS

DO YOU KNOW

that in the BURNING OF BRICK a DRAFT GAGE is of greater advantage than a PYROMETER? We furnish both.

DO YOU KNOW

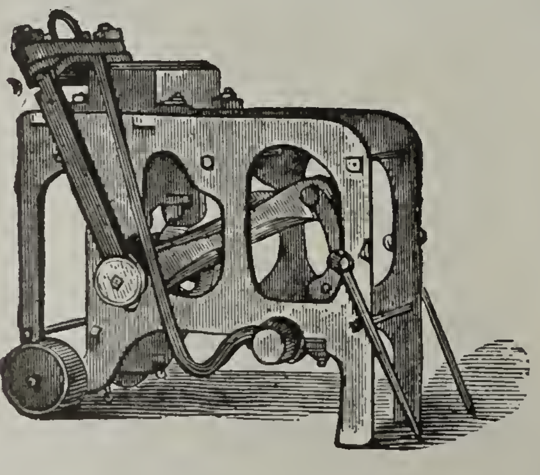
that for many years we have made the BEST DRAFT GAGES for all styles of kilns?

Write us for information of all kinds of controlling apparatus for clayworkers.

Ceramic Supply & Construction Co., Columbus, Ohio

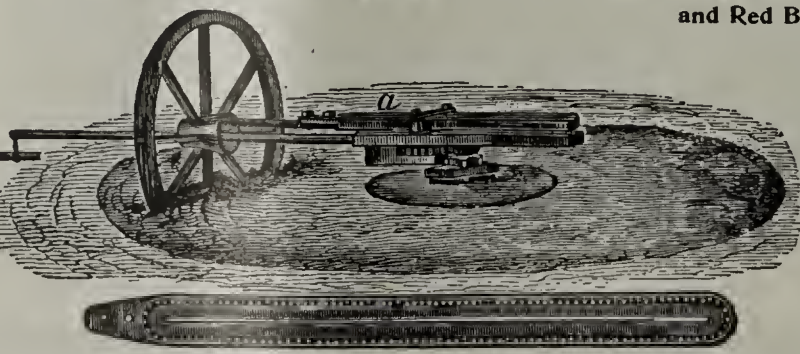
Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.



RED BRICK PRESS.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



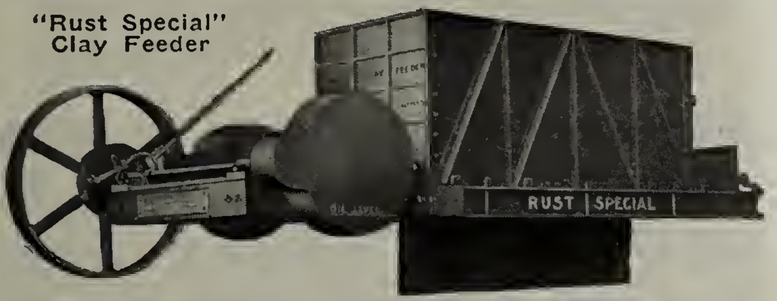
These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞ Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special"
Clay Feeder



Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your off-bearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
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SUBSCRIPTION TIME.

Do you know, dear reader, that when you buy magazines from month to month you are paying from one-fourth to one-half more than you need to?

		Our Price
CLAY-WORKER	$2.00	$6.50
The Mantel, Tile and Grate Monthly	2.00	
McClure's	1.50	
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Value	$10.00	

Address all orders to **T. A. RANDALL & CO., Inc., Indianapolis, Ind.**

ELLIS LOVEJOY
Consulting Engineer
COLUMBUS, OHIO

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Geological Examination of Properties

Clay Testing

Investigation of Manufacturing Propositions

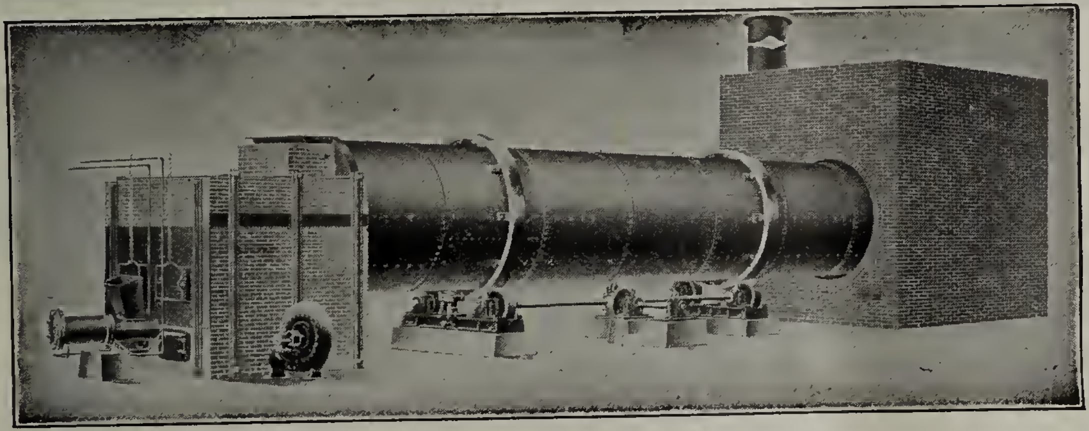
Plants Designed, Construction Superintended and Operations Directed

Dryers, Furnaces, Kilns

Remodeling Old Plants Given Special Attention

Development of New Lines of Products

Appraisal of Plants



ROTARY CLAY DRYER

DRY YOUR CLAY
AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
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THE QUINCY IMPROVED GATHERER

used in connection with our SPECIAL CLAY PLOW is adapted for taking clay or shale from the surface of the field. Actual tests and testimonials from brick, tile, cement and pottery manufacturers in nearly every state in the Union verify our claim that with their use about one-half of the cost of doing this work can be saved.

LECHTENBERG BROS.
Successors to Central Iron Works
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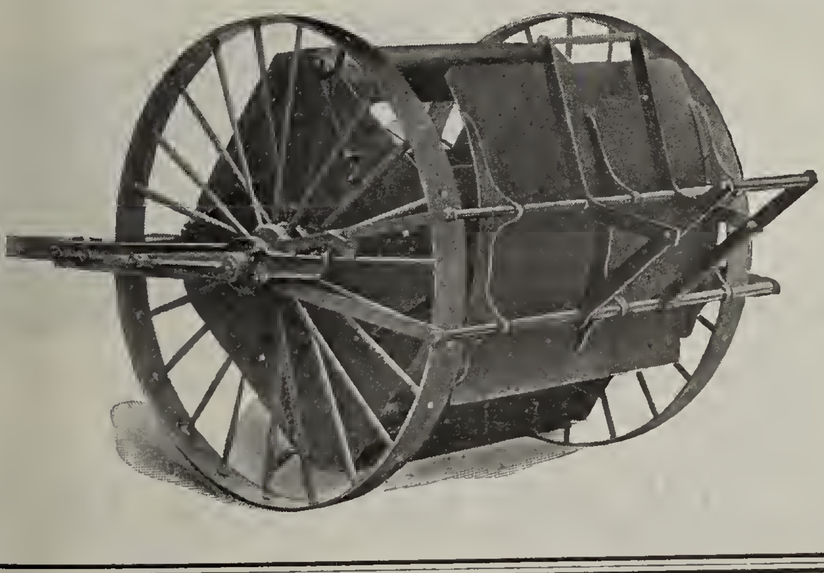

LABOR REDUCED
COST REDUCED
QUALITY INCREASED
QUANTITY INCREASED
by using

The National Steam Drier

Ask us about it.

The National Dry Kiln Company
1117 East Maryland St.
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"Nothing Succeeds Like Success"

THWING
HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

Have been placed in

EIGHT MORE
CERAMIC PLANTS

Since the Cleveland Convention

Are you interested?

Let us tell you about it.

Thwing Instrument Company
439 N. Fifth St.
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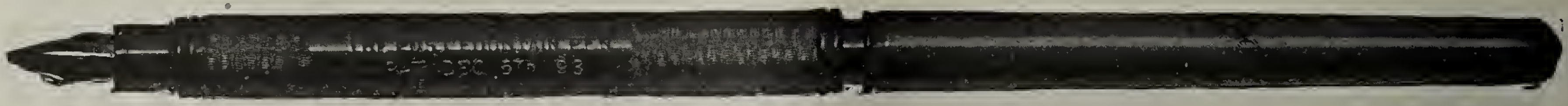

The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Soiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen. Lew Wallace, the author of "Ben Hur," wrote: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

ADDRESS THE CLAY-WORKER, INDIANAPOLIS, IND.

The Old Way

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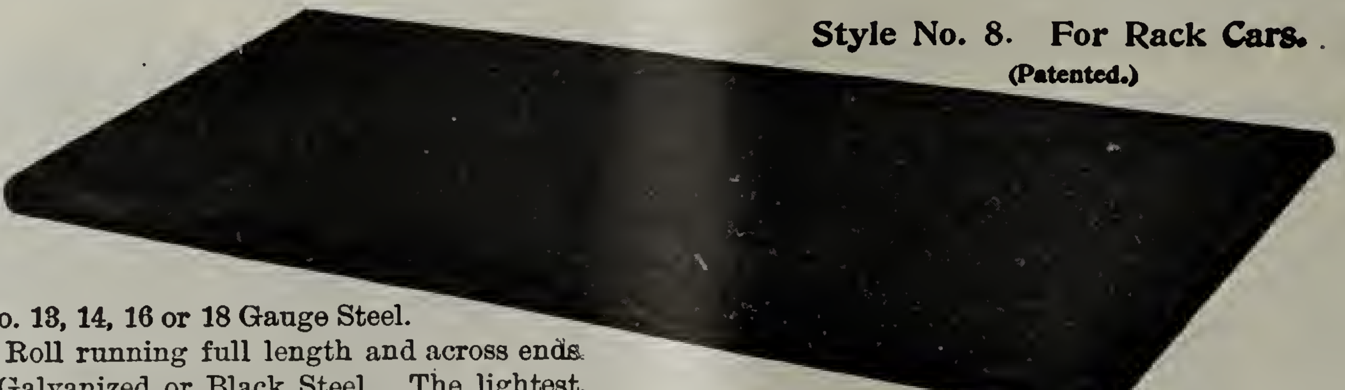
"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)



Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

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SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

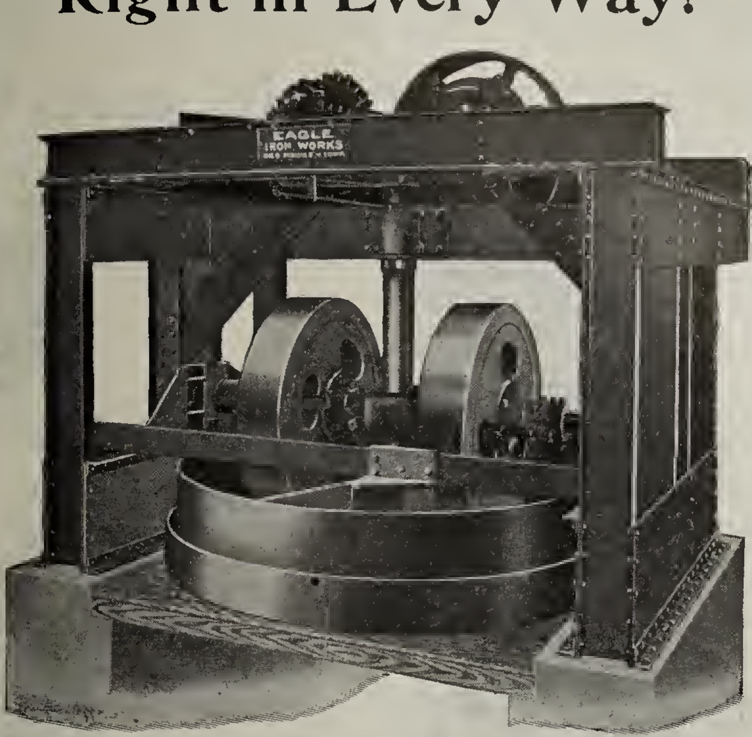
Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

A New Candidate for Favor! Right in Every Way!

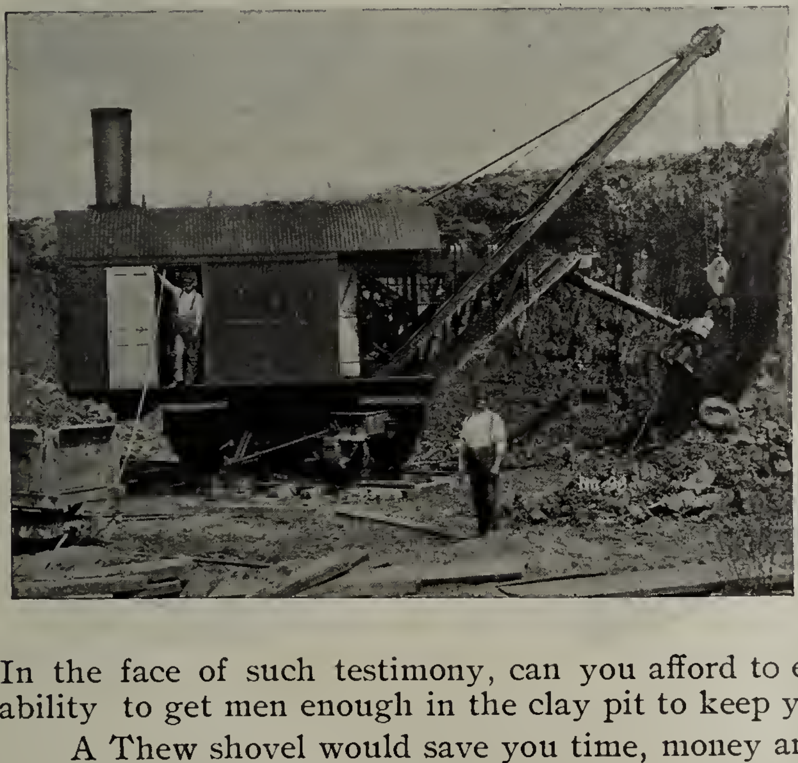


The 8 Foot Steel Frame Dry Pan

Built by the

EAGLE IRON WORKS
Des Moines, = Iowa

1,653,000 Cubic Yards in 24 Years



Clay for 264,000,000 Brick in 9 Years with Type 0 Thew.

Clay for 397,500,000 Brick in 15 Years with Type 3 Thew.

Clay for 31,000,000 Brick in 1916 with Type I Thew and but half a day's delay during the year.

Twenty-four years of service and still operating and the owner writes: "The shovel is not very handsome to look at but it does its work without any trouble. We can't say anything too good for the shovel or for The THEW COMPANY."

Over 300 Brick Manufacturers own THEW SHOVELS and will bear similar testimony.

239 Thew owners have given repeat orders.

In the face of such testimony, can you afford to employ old methods and have your output reduced by inability to get men enough in the clay pit to keep your plant running to capacity?

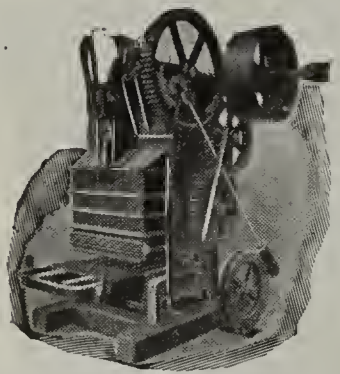
A Thew shovel would save you time, money and trouble, increase the output of your plant and improve the quality of your product.

Circular 22-F shows you why and gives valuable data. It is yours for the asking.

INVESTIGATE THE THEW. IT PAYS.

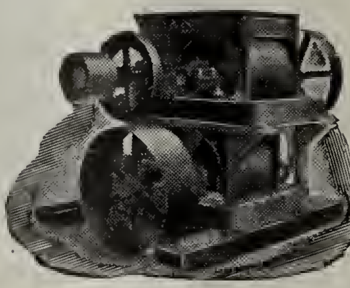
The THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

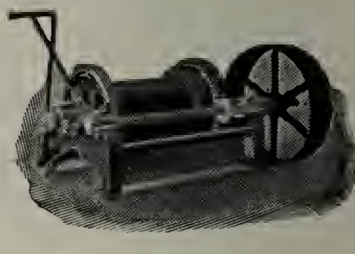
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

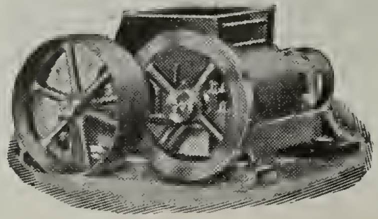

Vertical Brick Machine

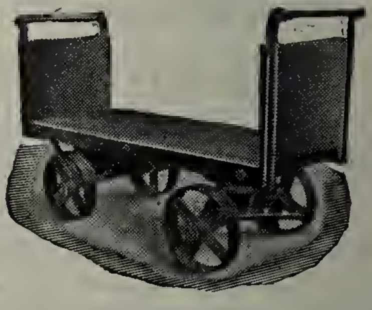
Style "A" Mould Sander

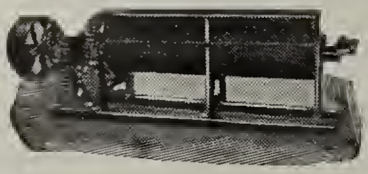
Style "P" Roller-Crusher

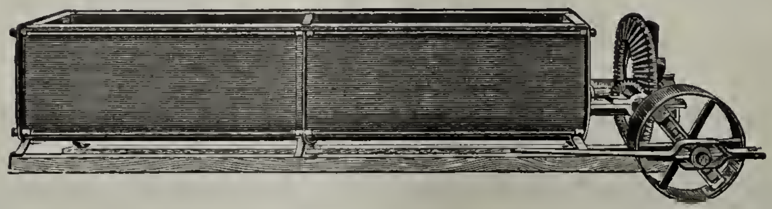

Style "P" Compound Disintegrator and Crusher

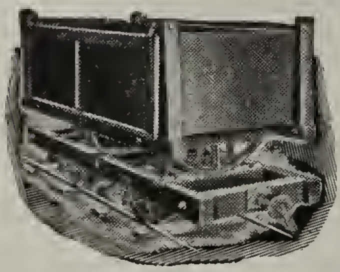

Style "B" Winding Drum

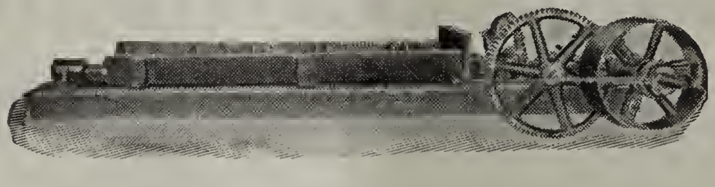

Style "A" and "P" Disintegrator

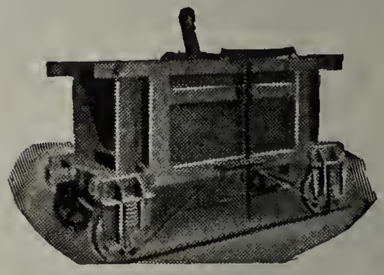

Mule Truck


Double Geared Pug Mill

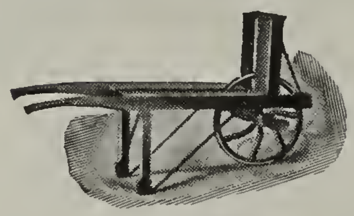

Single Geared Pug Mill

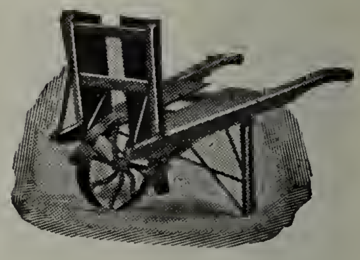

Side Dump Car

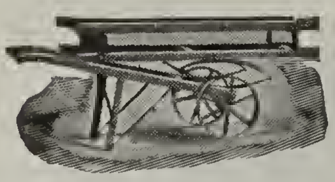

Feeder or Granulator

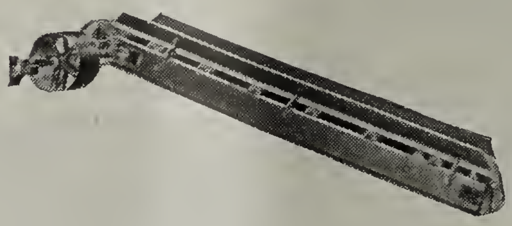

Bottom Dump Car

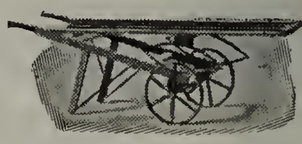
The Potts Rocker Grate
For any size fire box
on boiler or kilns


No. 6 Barrow


No. 2 Barrow


Double Deck Truck


Clay Elevator.


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for
Prices.

If it's to be Had
We Have it.

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

Hollow Tile House, by Fred'k Squires. Price, $2.50.

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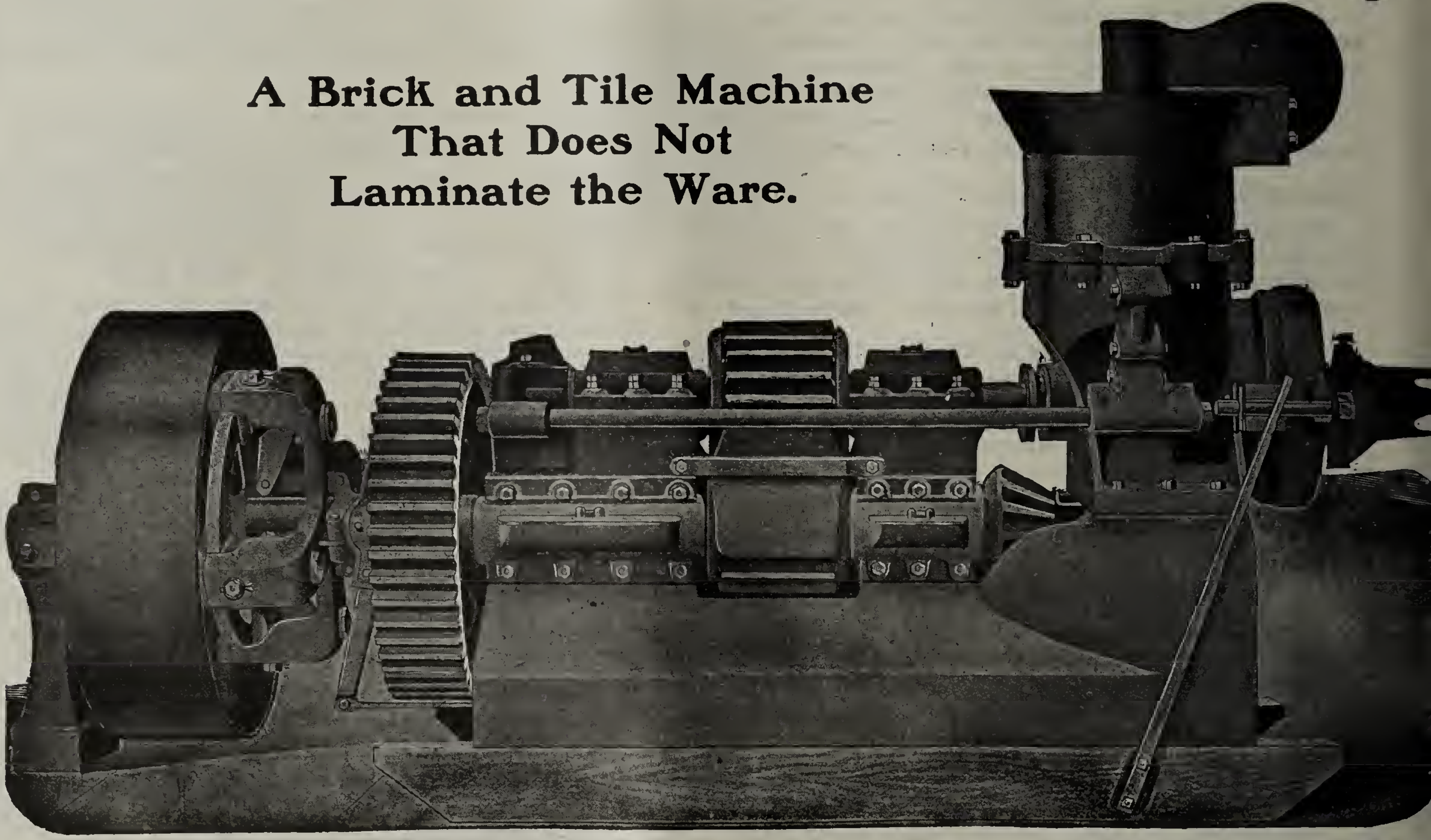

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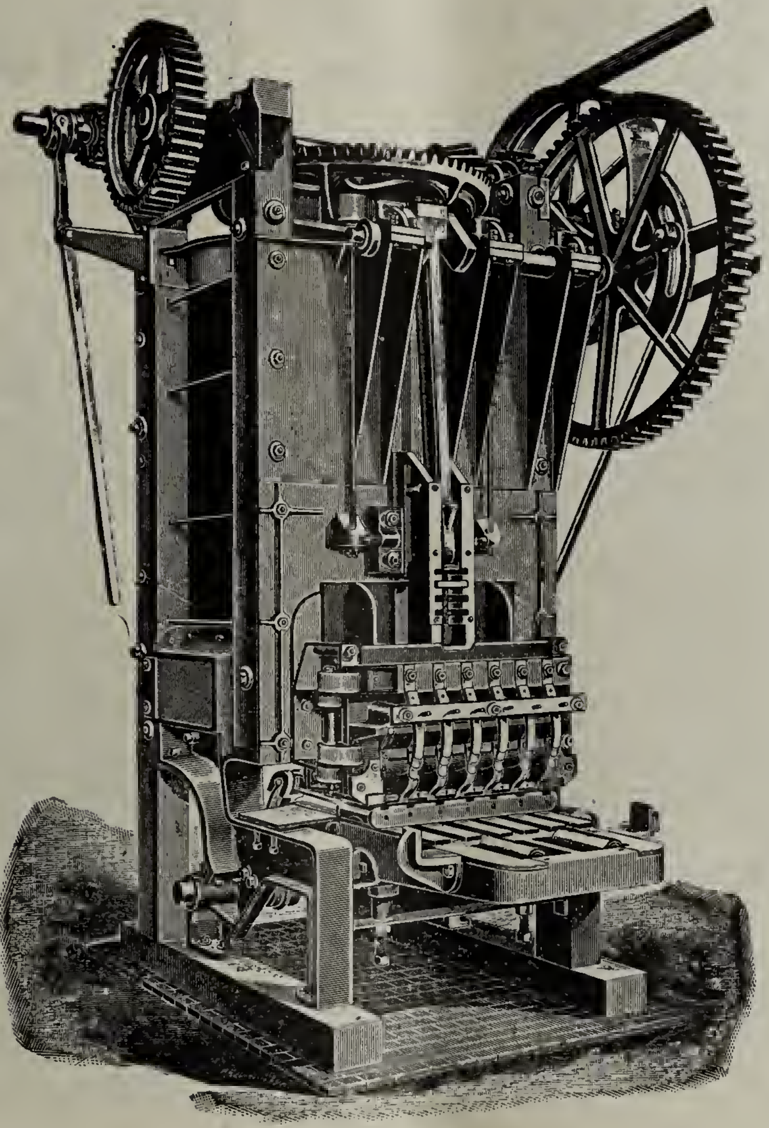

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Drying Clay Wares

By Ellis Lovejoy.

Author of

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Your library of ceramic literature is not complete without

DRYING CLAY WARES.

This splendid treatise covers every phase in the drying of any kind of clay ware.

It is the most valuable book of all our ceramic literature.

It is so terse and simple in its diction that it does not require a second reading to get the meaning.

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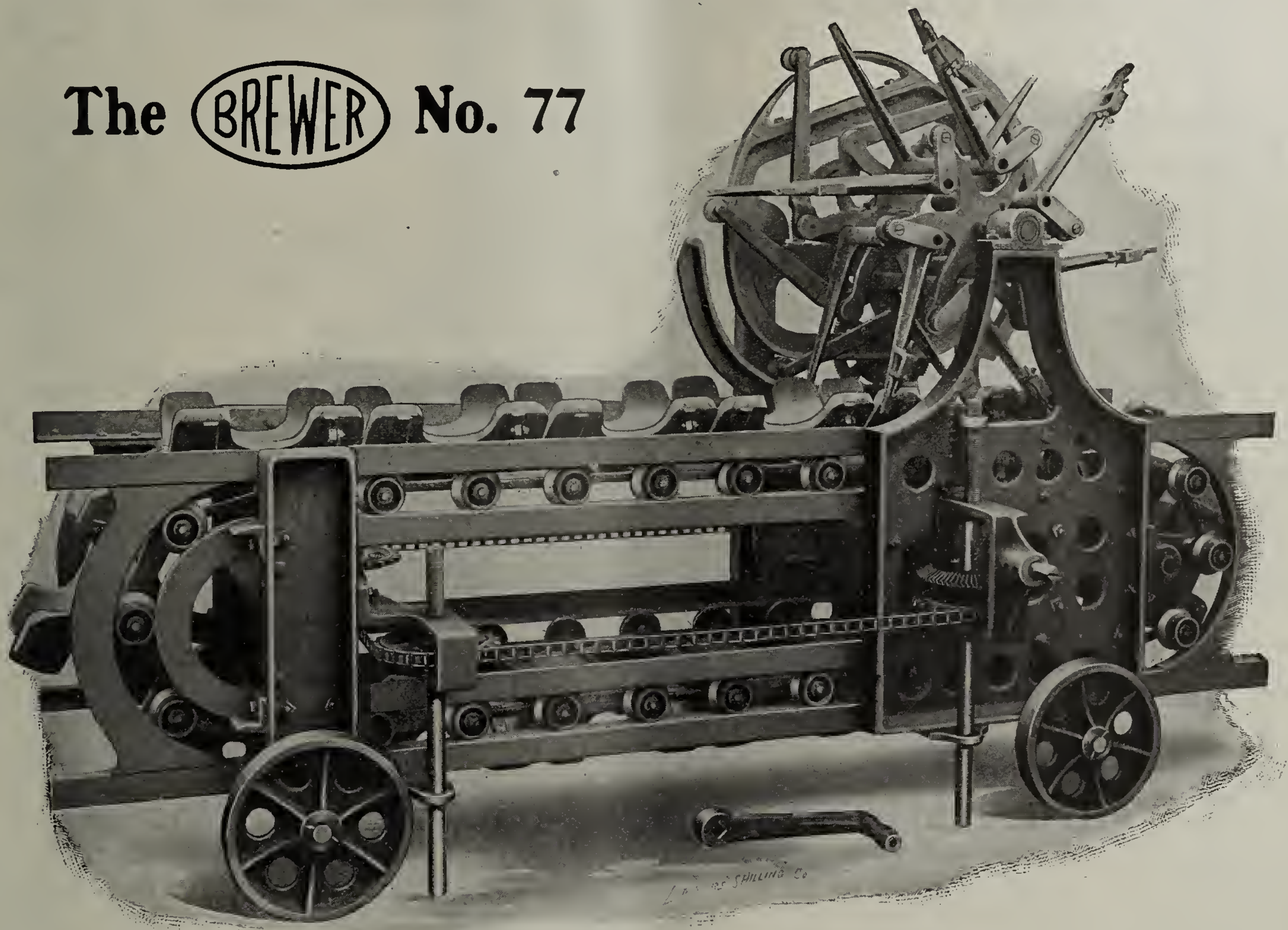

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No guide arms connected with the moving chain of carriers which interfere with the rapid removal of the ware.

Quick elevating and lowering device for adjusting height when changing sizes.

Mounted on wheels, easily moved to and from its position in front of the machine.

Cutting reel and chain of carriers geared together==cannot get out of time.

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The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

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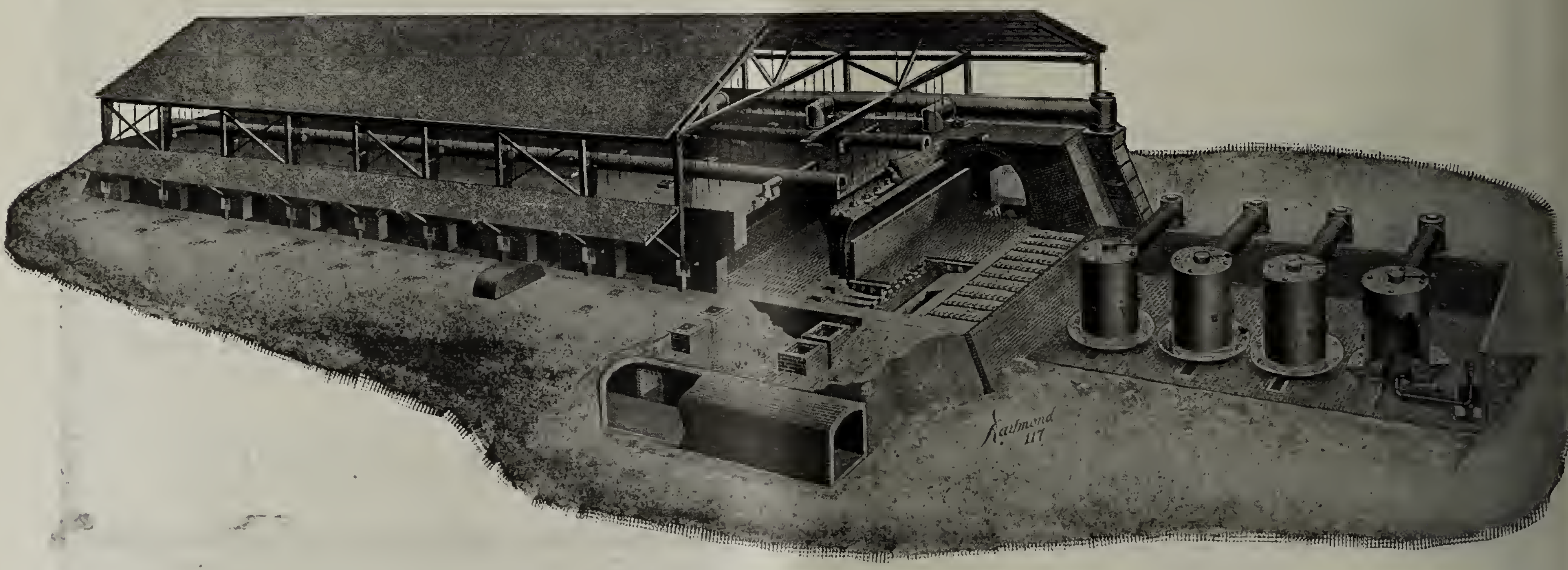
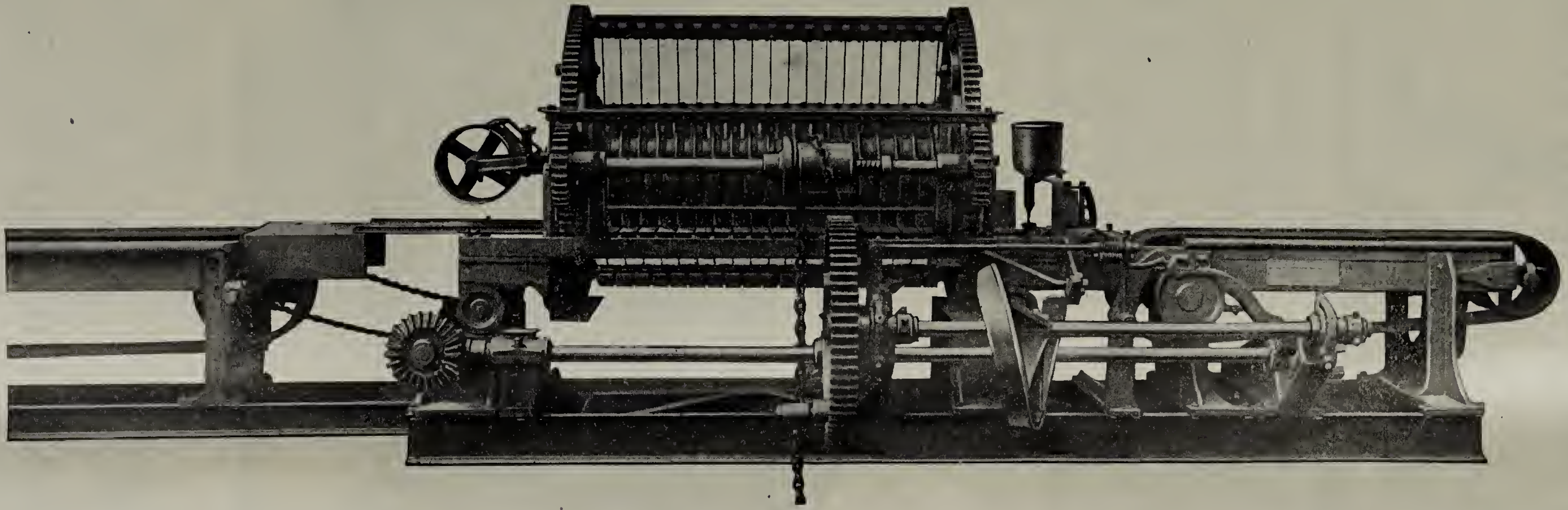


The Producer Gas Fired Continuous Kiln

Steele's New No. 18 Automatic Side Cutter

Capacity 15,000 brick per hour. Weight 6,000 lbs.



The power is applied to the reel so as to offer no resistance to the carriage. In fact, it helps start it moving.

The reel is driven by crank motion, which gradually starts and stops it, eliminating shocks and jars.

The back platens are fitted with spring jaws, to prevent breakage of wires.

The best wire suspension known, making possible effective wire cleaners.

This cutter solves a hard problem in the most effective way yet attained, especially in very large capacities.

Investigate.

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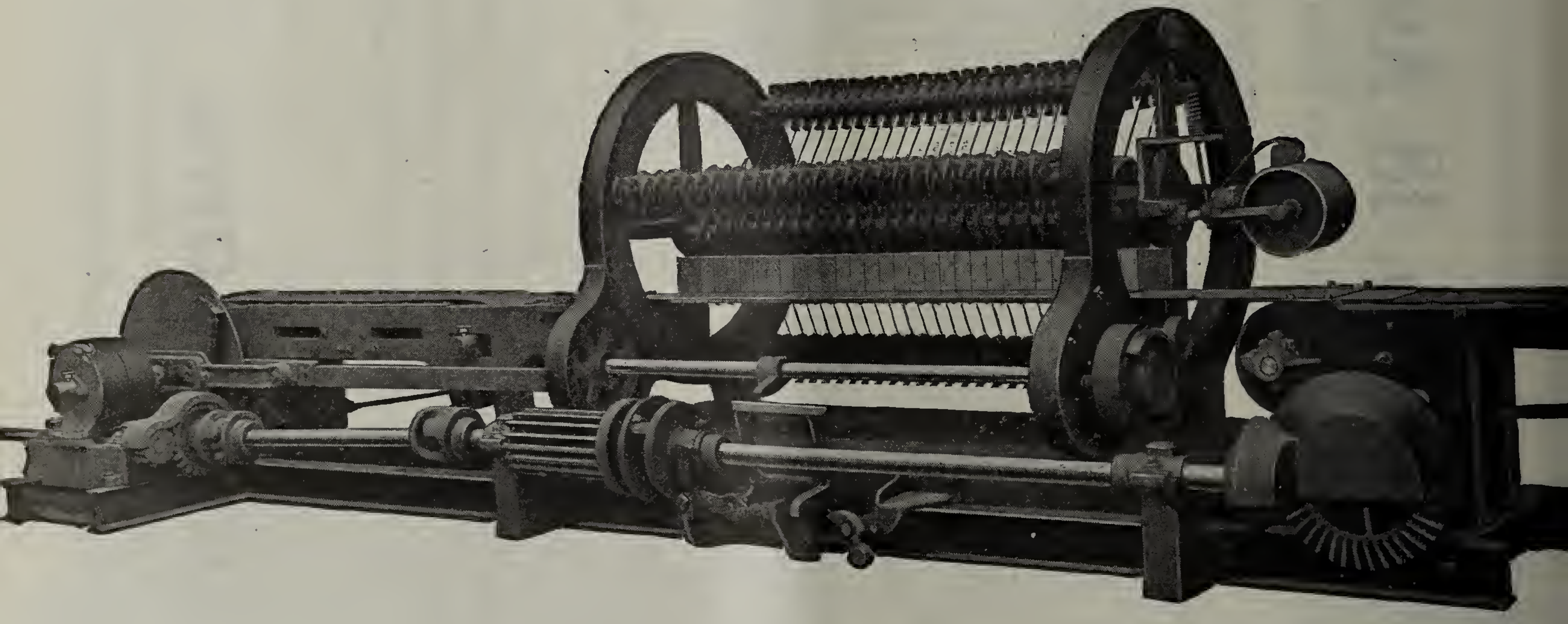
Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

INSTALL THIS CUTTER---AND FORGET IT

You'll find none of the usual cutter annoyances with a Freese Cutter. Its operating principle is so simple and understandable that it requires no expert in attendance—no special attention. Its mechanism is positive and sure-acting-—practically no changes in adjustment are necessary. You can depend upon satisfactory operation every day —a continuous production of straight, true brick.



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Dependable Machinery of Proven Efficiency

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Has stood for all
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Power Plant
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Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

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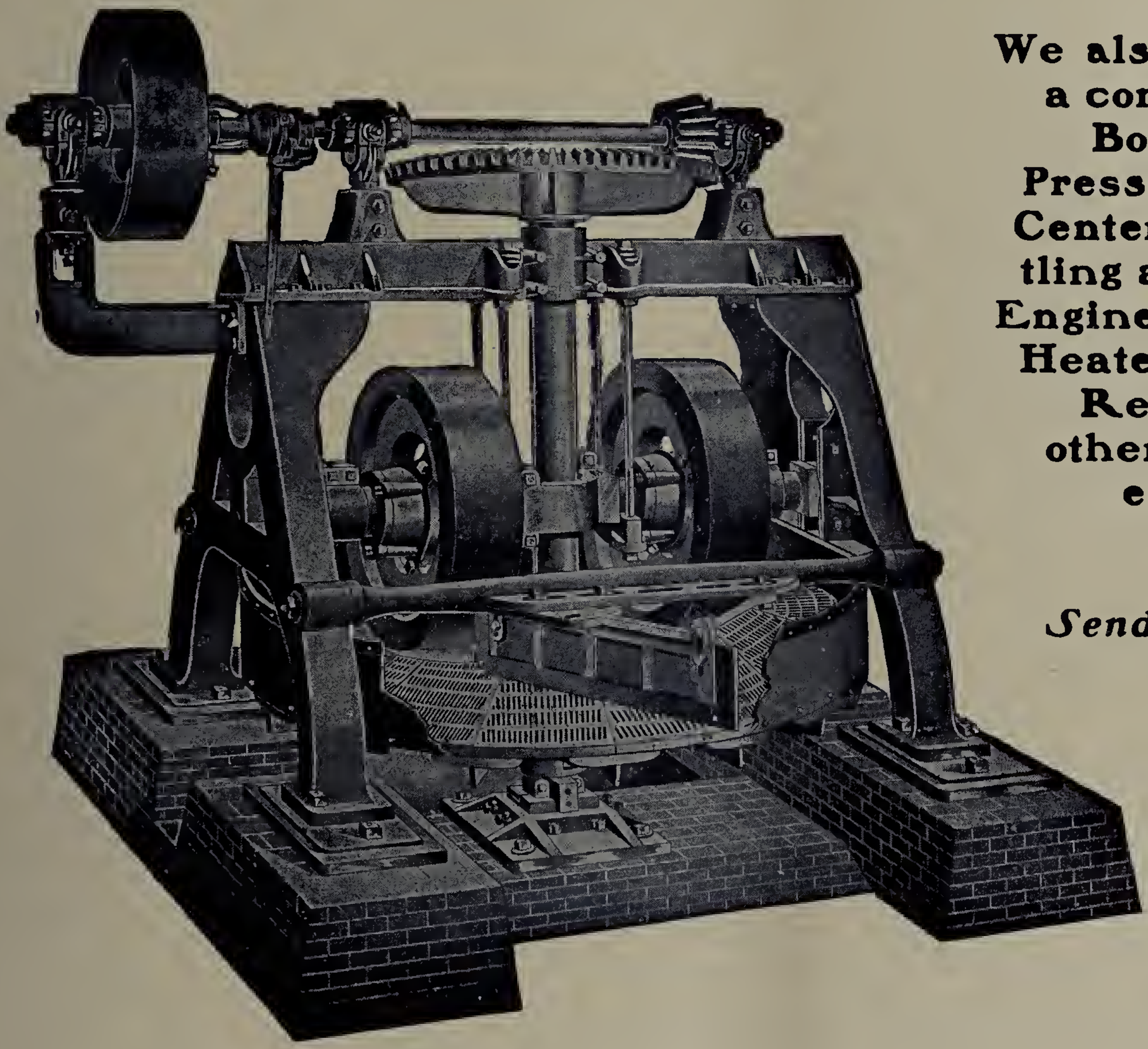

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The Wise Man of FATE

"The Plymouth Locomotive Cheaper than Horses"---

---*The Claycraft Brick Company*

It cost the Claycraft Brick Company, of Columbus and Groveport, Ohio, only $2.22 per day to operate The Plymouth Locomotive against $5.25 per day, the cost of operating with horses, in hauling clay from pit to mill, says M. J. Kaufman, the purchasing agent.

Further, brick are now being hauled at a cost of 40 cents per thousand as against 60 cents in the horse-driven system.

This is What Mr. Kaufman Actually Said:

"We used horses prior to the installation of The Plymouth. There were three at a cost of $675, which, with the harness and equipment, brought the first cost on a par with The Plymouth first cost.

"The feed for these horses was $2.25 per day. The labor to drive them $3 per day, making a total of $5.25.

"The Plymouth costs us in fuel and oil 72 cents per day and in labor $1.50, or a total of $2.22.

"And we have greater hauling power and are getting much more work out of The Plymouth than we did with the three horses.

"There is another gain, from the mining standpoint. We keep our men busy at the clay pit now.

"The cost of storing clay this year (1915) was 40 cents per thousand brick, against 60 cents when we used horses. This saving more than paid for the cost of The Plymouth and the extra cars in a few months' time.

"We have convinced ourselves that the gasoline type of locomotive is far the best machine for our purposes and that the Plymouth cannot be beat by any other make."

GET THIS BOOK We have a big book of facts—brimful of cost data; pictures and complete reports on installations in clay plants. Every clayworker—large or small, ought to have a copy of this book, just off the press. We will send a copy if you will mention this magazine.

THE J. D. FATE COMPANY, 242 Riggs Ave., Plymouth, Ohio

This Cutter Delivers Hollow Block on End Automatically

Here is a new cutter—one that the manufacturer of hollow ware has been wanting for many years. It cuts the block and delivers them automatically to an off-bearing belt and reduces labor cost, cuts down waste and makes a soft clay a profitable clay.

The Fate Type D Cutter

Revolutionizes Hollow Ware Manufacture

It delivers the block on end so that it may be safely and quickly handled on an off-bearing belt, which may be speeded up or slowed up at will with the Fate Friction Drive. It eliminates the man who. usually, has to stand at the end of the cutter, and it acts as an off-bearer.

This Clay Plant Gives Type D Cutter a Severe Test

One of the "Type D" machines has been in use in the plant of The Troy Fireproofing Co., Troy, N. Y. The clay here is of such a soft nature that, prior to the installation, it was difficult to produce ware with economy because of the waste at the delivery end of the cutter. The "Type D" Cutter cut this waste down to a minimum and the Troy plant now is enabled to produce perfect hollow block at good profit.

GET FACTS

Better get all the information on this wonderful device for hollow ware manufacture, and, at the same time, if interested in other clayworking machinery, let us give you complete advice on all your wants. There is a coupon at the right for your convenience—check off what you are interested in and mail today.

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☐ Disintegrators
☐ Conveyors
☐ Drain Tile Machinery
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☐ Industrial Locomotives
☐ Clay Feeders
☐ Pug Mills
☐ Crushers
☐ Elevators
☐ Clay Testing

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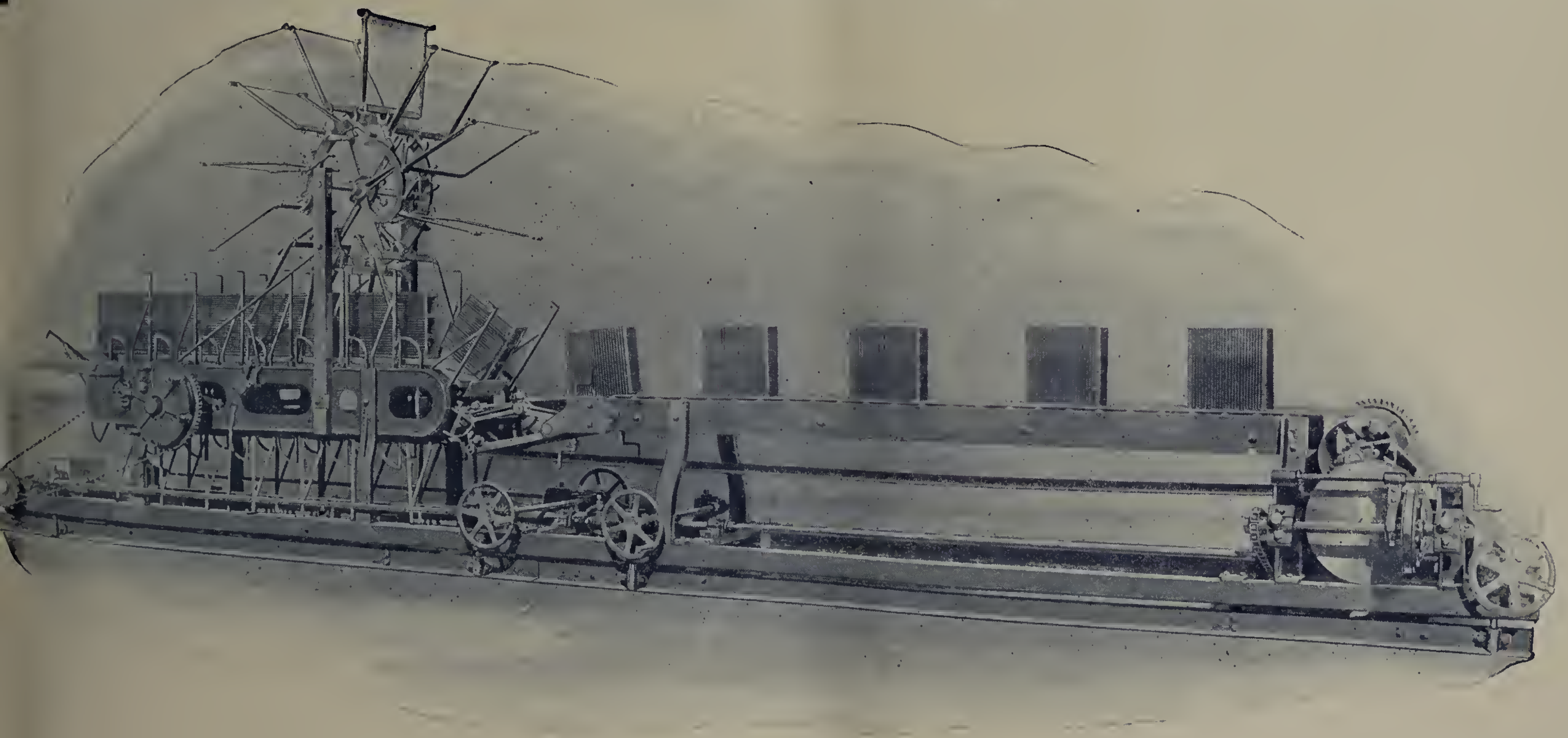

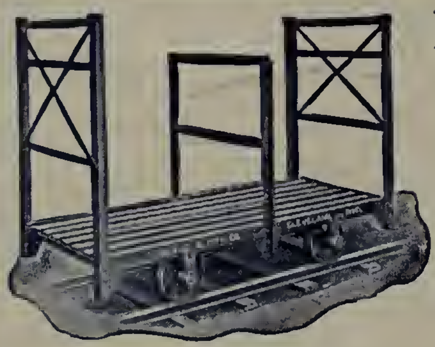

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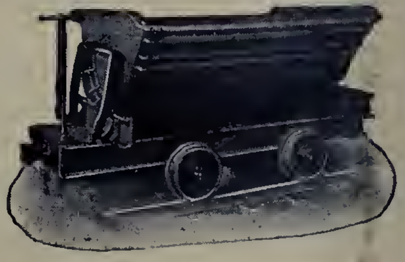

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Electric Locomotives

Rocker Side Dump Car
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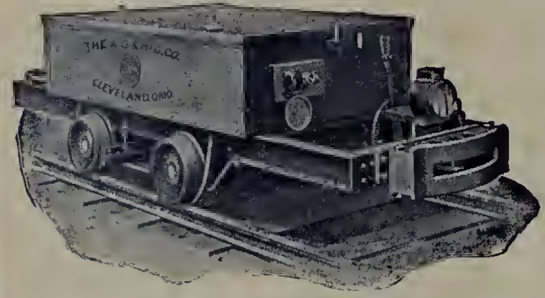

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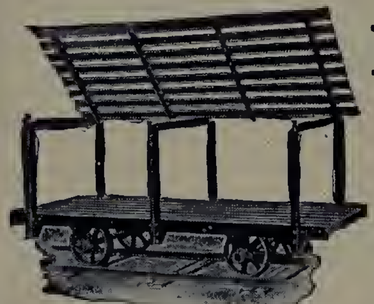

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THE CLAY-WORKER

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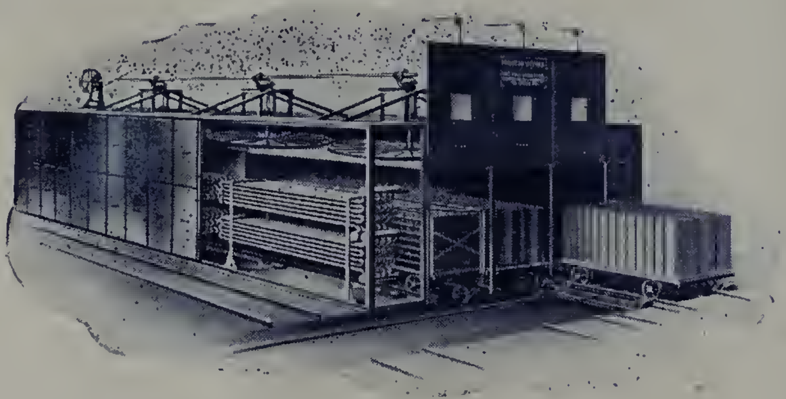
"Proctor" DRYERS

We respectfully invite you to
investigate the merits of

THE



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To help you in your investigation we make the following statements of fact—not claims—

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One brick plant now uses only 60 dryer cars whereas formerly they used 730, a saving of 670 cars and the space they took up.

⁂

In another plant the "PROCTOR" is safely drying nine duct conduit in 6 hours—former time 48 hours.

⁂

4-in. drain tile in 60 minutes.

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Standard plastic fire clay brick in 12 hours—former time 48 hours.

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You owe it to yourself to investigate this wonderful dryer that cuts down the cost and difficulty of drying.

⁂

Start your investigation now—write us.

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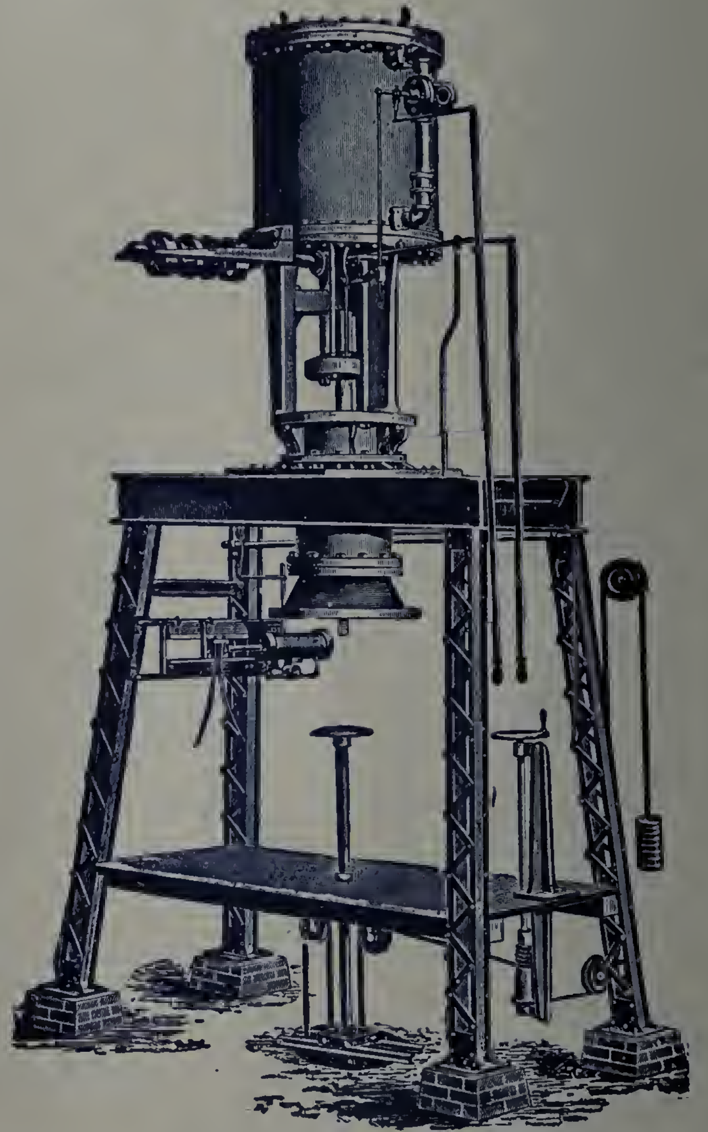
Philadelphia, Pa.

IT TAKES THE BEST TO MAKE THE BEST.

You cannot get a piece of steel out of a piece of lead.



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and above 150 other of the largest clayworking concerns in important commercial centers of the United States.

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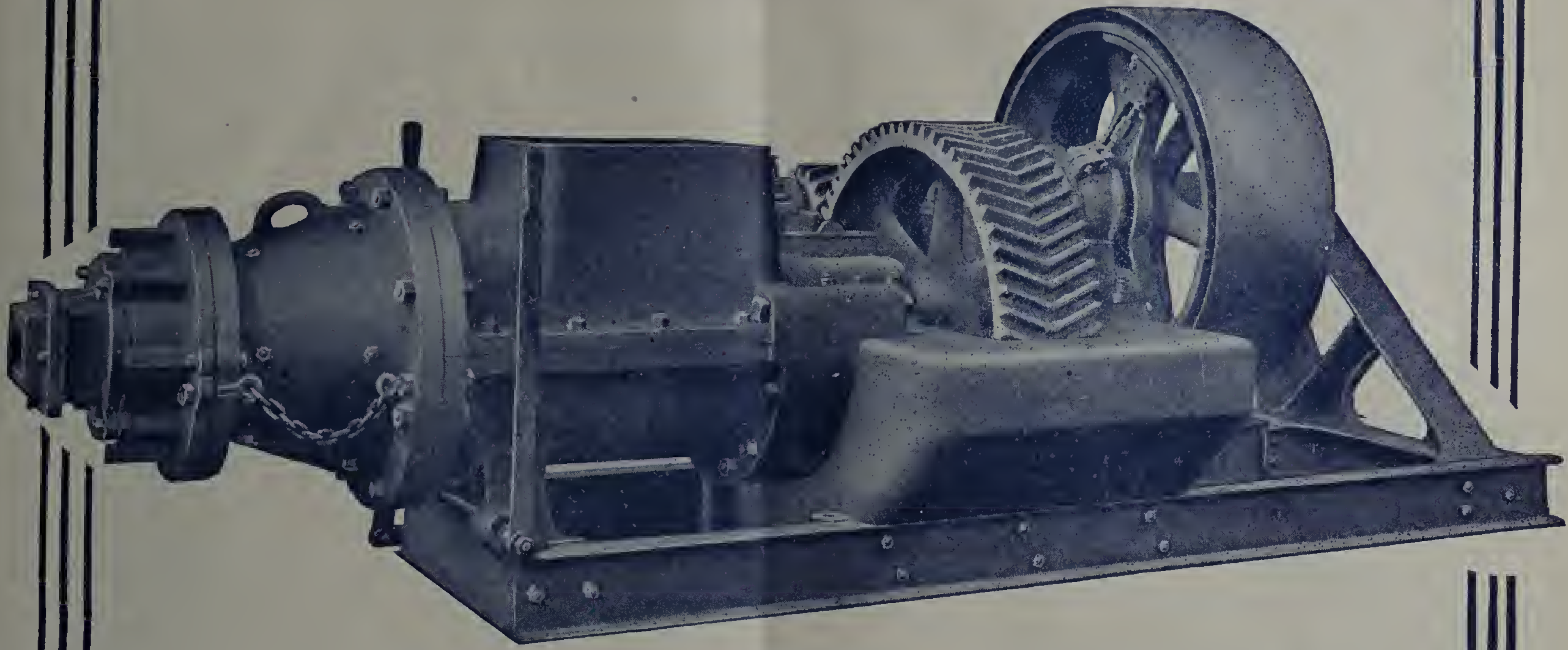

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We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

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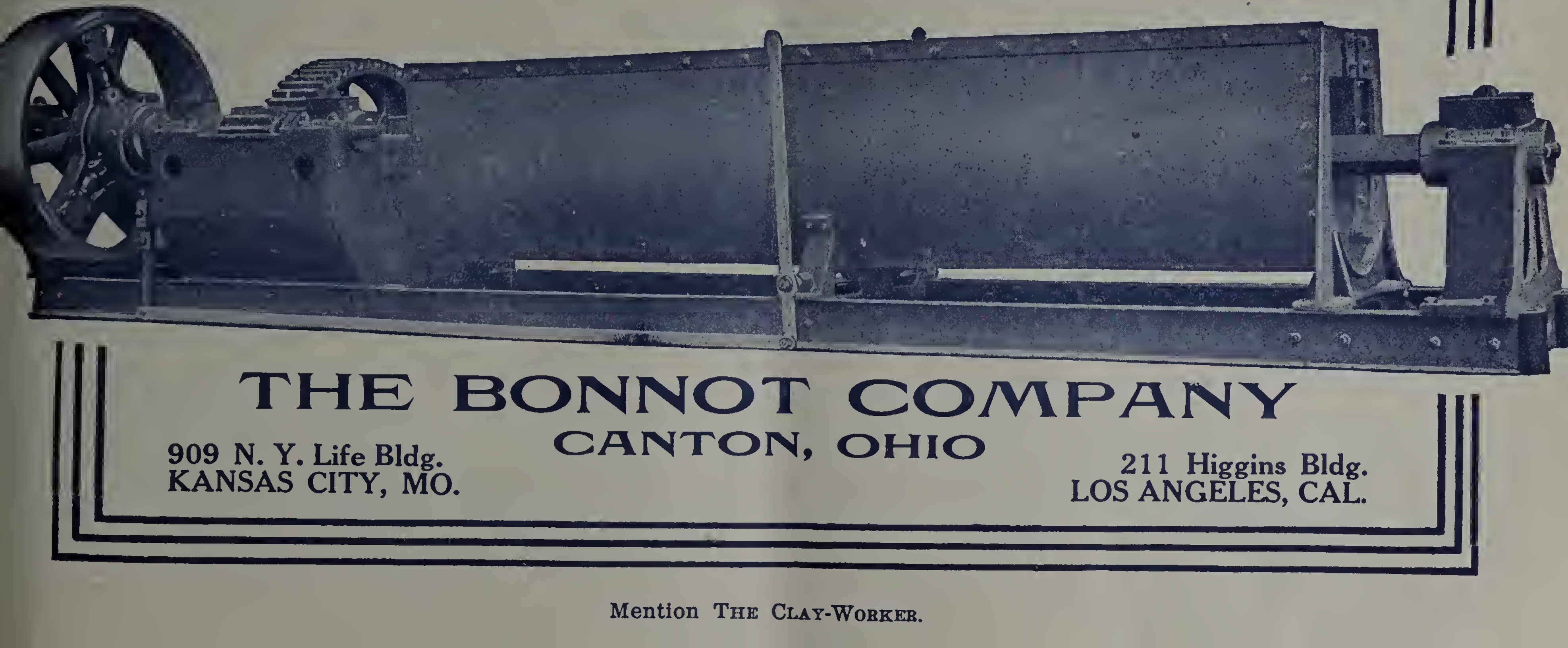

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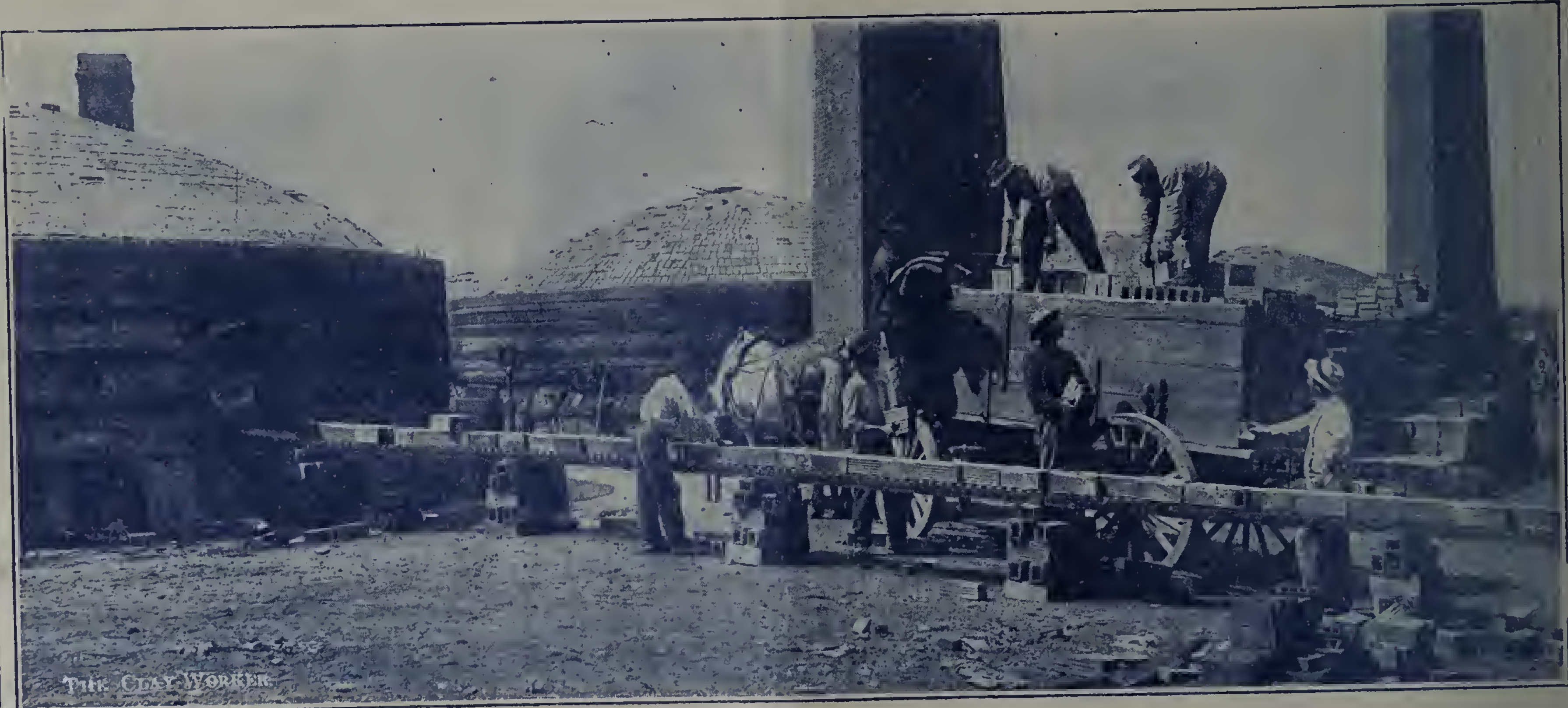
Make Yourself Independent of Your Wheeling Gang When the Rush Comes.



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Don't wait until you are in trouble before you order an outfit of Mathews Gravity Conveyers. You cannot expect us to have a system to fit your requirements all made up ready to ship the day you order it, no matter how badly you need it. We always have orders ahead of yours, and we need time—sometimes several weeks—to catch up with an accumulation of unfilled orders. Ask us now to send the nearest representative. He will tell you what you need, the cost, and get the order on file without waste of valuable time.

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RODGERS

FROM EVANSVILLE, INDIANA

June 5, 1916.

L. E. Rodgers Engineering Co.,
Zanesville, Ohio:

Gentlemen—Referring to the complete installation of our dryer made by your company, wish to state that usually testimonial letters are given soon after the installation. We have waited three years, which should add to the value of what we say now.

We are pleased to advise you that our fourteen-tunnel dryer is working so perfect that we are easily drying 61,000 brick per day with the thermometer registering only 180 to 200 degrees at the hot end.

We are using two large fans, requiring only thirty-three horse power to operate both, by actual meter measurements.

The exhaust fan is also doing double duty; besides drawing the air from the dryer, it furnishes draft for a forty-chamber continuous kiln.

We can easily increase the capacity of the dryer without adding anything to the building.

Thought you would be glad to have this information, and if it may be of service to you, you are certainly entitled to it.

Yours very truly,
STANDARD BRICK MFG. CO.
(Signed) By H. C. KLEYMEYER, Gen'l Mgr.

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ITS OWN BEST SALESMAN

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American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.

American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.

Brick (Building).

Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).

Parker-Russell M. & M. Co.

Brick (Paving).

Alton Brick Co.
Aspha-Bric Corporation.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Mchy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Fernholtz Brick Machy. Co.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Brick Machines (Soft Mud).

American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Martin Brick Mch. Mfg. Co., H.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Brick Machines (Dry Press).

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.

International Clay Mach. Co.

Brick Setting Machinery.

American Clay Machinery Co.

Buffing Machinery.

American Clay Machinery Co.

Burning and Drying Systems.

American Clay Machinery Co.
American Blower Co.
Boss, John C.
F. W. Dennis.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.

(See Dryer and Dumping Cars.)

Carbide Coating.

Stowell, E. R.

Castings.

American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.

Brick & Clay Engineering Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Clay Crushers and Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Phillips & McLaren Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clays.

American Clay Machinery Co.

Clay Dryers.

American Process Co.
Schaffer Eng. & Equip. Co.

Clay Feeders and Mixers.

American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.

(See Scrapers.)

Clay Steamers.

American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.

American Clay Machinery Co.
Fate Co., The J. D.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.

(See Supplies.)

Coloring Materials.

Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.

Orton, Edward, Jr.

Consultnig Engineers.

Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.

American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.

Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Schaffer Eng. & Equip. Co.

Couplings.

(See Supplies.)

Cutting Tables (Brick & Tile).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.

American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.
Webb Wire Works.

Dampers.

(See Supplies.)

Dies.

Louisville Machine Co., The.
(See Supplies.)

Disintegrators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.

Ceramic Supply & Con. Co.

Drain Tile Machinery.

(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.

(See Supplies.)

Dryers.

American Clay Machinery Co.
American Process Co.
Brick & Clay Engineering Co.
Boss Co., John C.
Chambers Bros. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
National Dry Kiln Co.
Philadelphia Textile Mach. Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

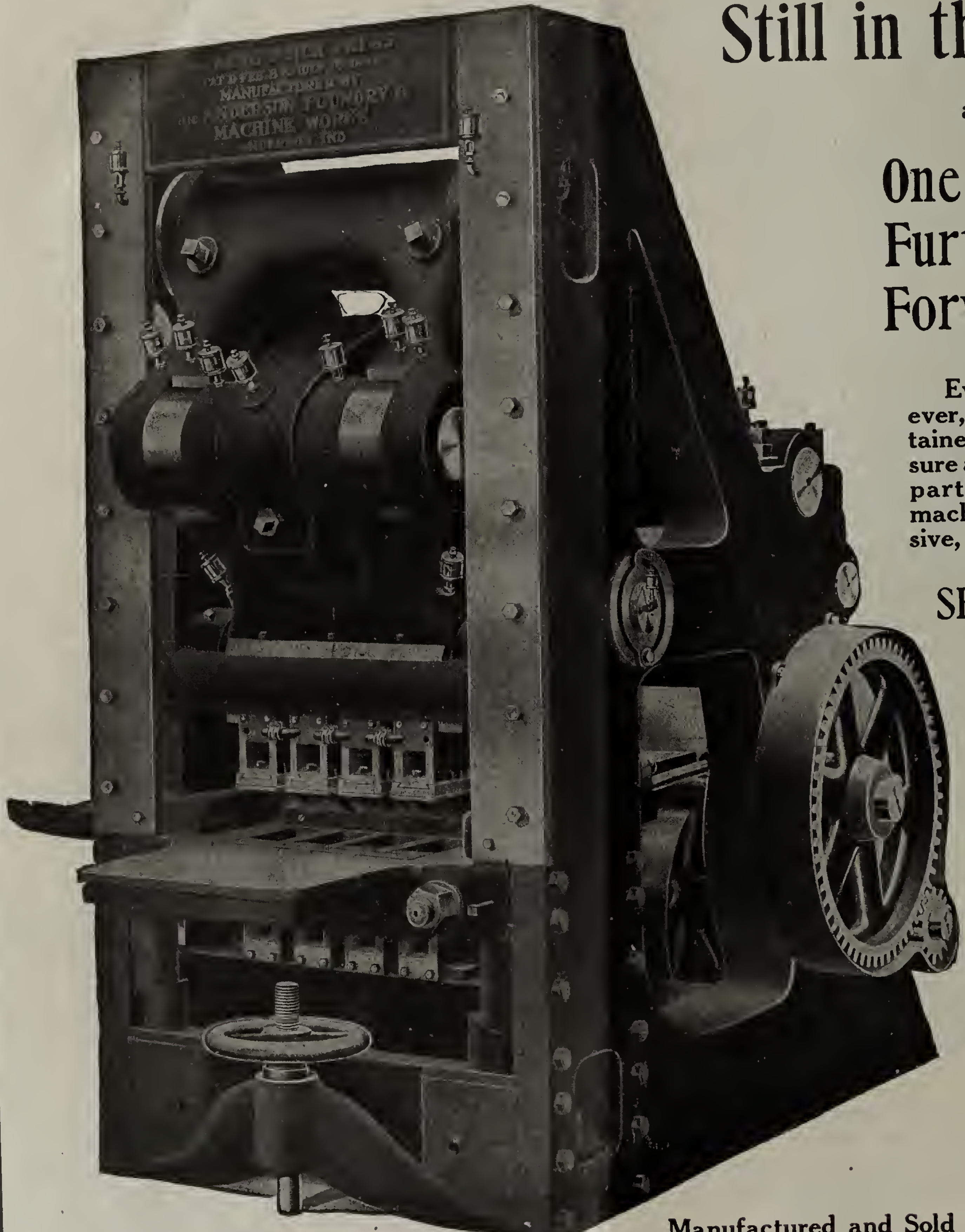
Dryer Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
National Dry Kiln Co.

(Continued on page 217.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE
FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

ANDERSON, IND.

Buyers Ready Reference List—Continued.

Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.
Wilson, Thomas M.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Louisville Machine Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Beighlee Electric Co., The.
Brown Instrument Co., The
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
Beighlee Electric Co., The.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

Elevating Equipment.

(See Conveyors.)

Engines.

American Clay Machinery Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Lovejoy, Ellis.
Rodgers Engr. Co., The L. E.
Schaffer Eng. & Equip. Co.
Trautwein Dryer & Engr. Co.

Fans.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

Filter Presses.

American Clay Machinery Co.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Fire Brick and Fire Clay.

Parker-Russell M. & M. Co.

Floor Tile.

Chicago Ret. & Fire Brick Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

Brick & Clay Engineering Co.
Brown Instrument Co., The
International Clay Mach. Co.

Gas Fire Continuous Kilns.

Raymond Co., The C. W.

Gears.

(See Supplies.)

Granulators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Grates.

American Clay Machinery Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.

Gravity Carriers.

Mathews Gravity Carrier Co.
Taplin-Rice-Cerkln Co.

Gravity Haulage.

American Clay Machinery Co.

Grouter.

Marsh-Capron Mfg. Co.

Hand-Power Presses.

American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Stevenson & Co.

Hand Winch.

(See Supplies.)

Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Illustrators.

Lamb, J. & R.

Insurance.

Mantel, Tile and Grate Monthly.

Jacks.

(See Supplies.)

(Continued on page 219.)

MUELLER'S NEW AUGER BRICK MACHINERY

Auger Brick Machines of most advanced design, in capacity from 8,000 to 60,000 per day.

Horsepower Brick Machines, Hand Plunger Presses for drain tiles, hollow blocks, etc.

Smooth Roll Crushers, with two and three rolls, Break-roll Crushers for hard shale.

Pug Mills, single or double shaft, for any capacity, Automatic Feeders.

Automatic Brick, Block and Drain Tile Cutters.

Hand tables for all kinds of clay products, designers of special tables.

Complete equipment for making lockplate building blocks, coupling building blocks and other hollow wares.

ROOFING TILE MACHINERY

Revolving Presses, Trimming Presses, Hand Roofing-Tile Presses, molds in plaster or metal.
Special Double Shaft Auger Machines for roofing tiles, and mechanically lubricated dies.
Cutting tables for shingles, promenades, interlocking, Spanish tiles etc.

MUELLER BROS.

1436 Macklind Ave. (on Frisco Tracks) ST. LOUIS, MO.

Trautwein
DRYERS

What Trautwein Service Means---

As manufacturers of Dryers and Dryer Equipment we are prepared to study the conditions at your plant—to make a commercial test of your clay to determine what method of drying will best suit your needs—

We have no single set design or ideas to force upon you.

Also—as Engineers we have gained an enviable reputation as Complete Plant Builders, and we can point with pride to our achievements.

Yet—we are also just as proud of the fact that our recommendations have kept many misguided enthusiasts from disastrous ventures when we showed them that they did not have a proposition that could be made a commercial success.

If That's the Kind of Service YOU Want---

Write us—tell us of any conditions in your plant that may be bothering you—or of any plans you have in mind. There will be no obligation—rather will it be a pleasure to study your problems.

Trautwein Dryer & Engineering Co.

Manufacturers of Drying Equipment
ENGINEERS---
417 South Dearborn St. CHICAGO, U. S. A.

Do Any of Your Kilns Look Like This?

There's One Safe Way

to prevent this condition—one sure way to save that big item of "kiln repairs" that you have been charging up each year—adopt

The Smith Steel Encased Kiln

We have facts and figures to prove what savings we have made for others—why not let us send them to you?

CLAUDE SMITH CO.

KILN BUILDERS
Plymouth Bldg., Chicago, U. S. A.

Buyers Ready Reference List—Continued.

Kilns.
American Clay Machinery Co.
Boss Co., John C.
Brick & Clay Engineering Co.
F. W. Dennis.
Hook Patent Kiln Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Ohio Kiln Co., The.
Richardson, W. D.
Smith Co., Claude.
Swift, Edward A.
Yates, Alfred

Kilns, Doors, Castings and Frames
(See Supplies.)

Kiln Bands.
Holliday, W. J., & Co.

Kiln Floor Tile.
Chicago Ret. & Fire Brick Co.

Knives.
(See Supplies.)

Locomotives.
Davenport Locomotive Works.
Dewey Bros.
Fate Co., The J. D.

Manganese.
(See Coloring Materials.)

Mechanical Draft.
American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

Mineral Paint.
(See Coloring Materials.)

Molds (Brick).
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.
American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
Hensley, J. W.
International Clay Mach. Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Wallace Mfg. Co.

Mortar Colors.
(See Coloring Materials.)

Motor Trucks.
Fate Co., The J. D.

Oil Burners.
Schurs Oil Burner Co.

Paints.
(See Coloring Materials.)

Pallets.
Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).
(See Dry and Wet Pans.)

Paving Brick or Block.
(See Brick.)

Perforated Sheet Metal.
Caldwell & Sons, H. W.
Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

Pitch (Paving).
Barrett Mfg. Co.

Plows.
(See Scrapers.)

Poldometers.
Schaffer Eng. & Equip. Co.

Portable Track.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.

Pottery Machinery.
American Clay Machinery Co.
Baird Machinery & Mfg. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

Powder.
Dupont, E. I. & DeNemours Co.

Power Plant Equipment.
American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Presses.
(See Brick Machines, also Sewer Pipe Machinery, also Roofing Tile Machinery.)

Pug Mills.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Pulleys.
(See Supplies.)

Pulverizers.
American Clay Machinery Co.
American Pulverizer Co.
Fate Co., The J. D.
Taplin-Rice-Clerkin Co.

Pumps.
Ceramic Supply & Con. Co.
Dean Bros. Steam Pump Wks.
Potts & Co., C. & A.

Pyrometers.
Beighlee Electric Co., The.
Brown Instrument Co.
Ceramic Supply & Con. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co., The

Rails and Railway Equipment.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Ceramic Supply & Con. Co.
Davenport Locomotive Works.
Fate Co., The J. D.
Lakewood Engineering Co.

Rattlers (Paving Brick).
American Clay Machinery Co.
Ceramic Supply & Con. Co.
Freese & Co., E. M.
Hetherington & Berner.
Phillips & McLaren Co.

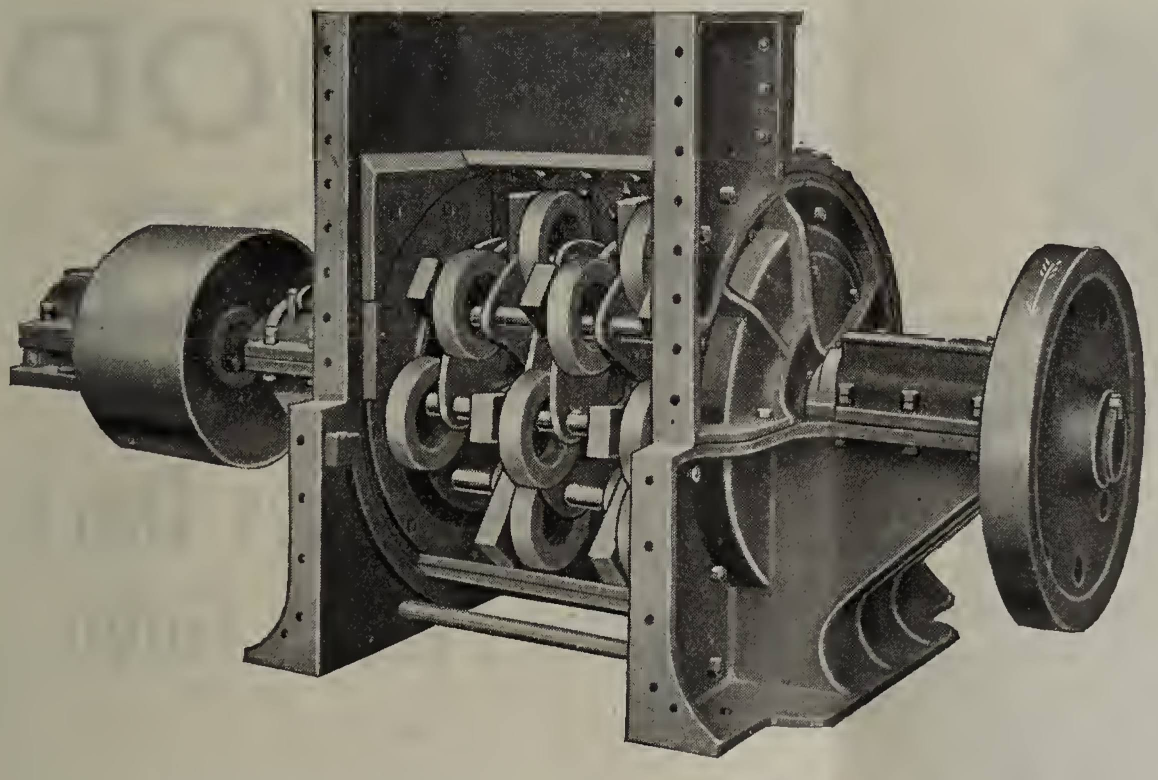
Recording Gauges.
Brown Instrument Co.
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Represses.
American Clay Machinery Co.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Revolution Indicators.
Brown Instrument Co.
Ceramic Supply & Con. Co.

Revolving Steam Shovels.
American Clay Machinery Co.
Thew Automatic Shovel Co.

(Continued on page 220.)



The **MACHINE**
that has
POWER to PRODUCE
and will pulverize Shale or Shale and Clay, Brickbats, Coal, Coke, Marl, Kaolin, Sandstone, Burnt Lime, Fire Clay, etc.

Are You in Need of a MACHINE

that can pulverize **18 to 25 Tons of Shale and Clay per hour** and save 50 per cent installation cost.

Describe your material, ask for catalog, and information.

GEO. C. VIDETTO
Eastern Sales Manager
207 Fulton Building, Pittsburg, Pa.

American Pulverizer Co.
EAST ST. LOUIS, ILLINOIS

Buyers Ready Reference List—Continued.

Rock Crushers.
American Clay Machinery Co.
American Pulverizer Co.
Phillips & McLaren Co.

Roofing Tile Machinery.
American Clay Machinery Co.
Fate Co., The J. D.
International Clay Mach. Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Rope.
(See Supplies.)

Rotary Dryers.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Fate Co., The J. D.
Hensley, J. W.
International Clay Mach. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.

Sand Dryer and Sand Sieves.
American Clay Machinery Co.
Ceramic Supply & Con. Co.

Sand Lime Brick Machinery.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Fernholtz Brick Machinery Co.
International Clay Mach. Co.
Lakewood Engineering Co.

School of Ceramics.
Illinois University.
Iowa State College.
New Jersey State School.
New York State School.
Ohio State University.

Scrapers, Plows and Clay Gatherers.
Arbuckle & Co.
Lechtenberg Brothers.
Eagle Iron Works.

Screens.
American Clay Machinery Co.
Brewer & Co., H.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Harrington & King Perf. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Taplin-Rice-Clerkin Co.

Sewer Pipe Machinery.
American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Taplin-Rice-Clerkin Co.

Steam Gauges.
(See Supplies.)

Steam Shovels.
American Clay Machinery Co.
Thew Automatic Shovel Co.

Steam Specialties.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Steam Traps.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Steel Pallets.
Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Atlas Car & Mfg. Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
Hensley, J. W.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Martin Brick Mach. Mfg. Co., H.
Potts & Co., C. & A.
Steele & Sons.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Switches.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Lakewood Engineering Co.

Tempering Wheels.
Carnell, Geo.
International Clay Mach. Co.

Thermometers.
Brown Instrument Co.
Ceramic Supply & Engr. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co.

Tile Machines.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., H.
Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
Hensley, J. W.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Time Recorders.
Beighlee Electric Co., The.
Brown Instrument Co.
Ceramic Supply & Engr. Co.
Thwing Instrument Co.

Tracks and Switches.
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(See Pans.)

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(See Cutting Wire.)

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ALWAYS MAKES GOOD.

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CHICAGO BRICK MACHINERY CO.

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Dayton, Ohio.

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LET MENTZ

YOUR FUTURE

LET MENTZ MOULD YOUR FUTURE

MENTZ MOULDS WILL MOULD YOUR FUTURE SO YOU WILL SAVE MONEY, MAKE A BETTER PRODUCT AND LARGER PROFITS.

MR. George B. Mentz has made a lifetime study of the manufacture and use of brick moulds on his plant near the Hudson River. His close contact with the manufacturers of soft mud brick and the brick business in the East affords him every opportunity of knowing what is required and what is absolutely right. His moulds meet every requirement, and today are far superior to any other moulds made in this country.

The general use of Mentz Moulds in the great Hudson River and New Jersey brickmaking districts and throughout the East and in Canada, shows their real value. These moulds are also found in the leading soft mud plants in the Middle West. It is a fact that can be proven that no brickmaker who has given the Mentz Moulds a fair trial would do without them.

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WALLKILL, N. Y.

"Aspha-Bric"

A high grade type of paving brick, produced at a nominal cost, from your common builders.

Aspha-Bric can be produced by you. Send samples of your materials to Chicago address for complete test.

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The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

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A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

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Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

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Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

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A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

Drying Brick, by W. D. Richardson. Price 25 Cents.

A little booklet giving and explaining the various styles of dryers, etc.

T. A. RANDALL & CO.
Indianapolis, Ind., U. S. A.

"PAVE WITH BRICK" SIGNS FREE

Be a Booster for Brick Streets and Highways.
Send for signs to tack up where dependable pavements are needed.

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Will P. Blair, Secretary, Engineers' Bldg. CLEVELAND, OHIO

SHAWMUT VITRIFIED PAVING BRICK WORKS

Shawmut, Pa. Alfred Yates, Gen. Mgr.

Vitrified Shale and Fire Clay Paving Brick and Blocks.
Burned in Yates' Patent Kiln.
Samples and prices on application.

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Makers of High Quality Brick for
Roadways and Permanent Buildings.
Repressed and Wire-Cut-Lug Block.
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OXBLOOD RED FRONT BRICKS
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Highly Vitrified by Natural Gas.
Tough Paving Blocks, Beautiful in Color and Finish.
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Chocolate Red
Highest Vitrification—Lowest Absorption.
BEST BY TEST.
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Manufacturers of Bessemer Block
The Most Uniform Shale Paver Made.

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THE DEPENDABLE ROADWAY

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The block with experience and service behind it. For 29 years the product of the present company has given satisfaction. We are the oldest paving brick manufacturers in Ohio west of the Ohio River.

MEDAL REPRESSED WIRE-CUT-LUG
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Daily Capacity
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A BLOCK OF THE IRONSTONE QUALITY IS ECONOMY

REPRESSED OR DUNN WIRE-CUT-LUG

Terre Haute Vitrified Brick Co.

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Murphysboro Paving Brick Company

Manufacturers of

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The Block That Stands the Test.

Prices and samples furnished upon application.

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A valuable treatise on the manufacture and use of Paving Brick up to date. By H. A. Wheeler, E. M. Second edition.

Mailed to any address on receipt of $2.00.

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Write us for samples and prices.

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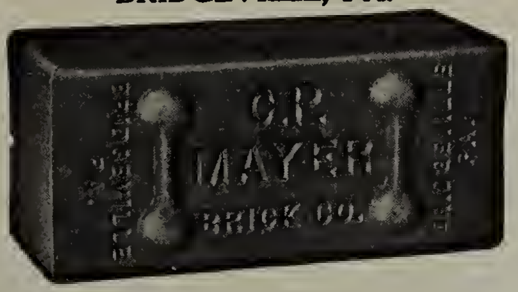

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The Louisville Machine Co.

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Dies for Clayworking our Specialty.

Brick, Fireproofing, plain and ornamental Hollow Ware Dies, for auger or steam press. Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

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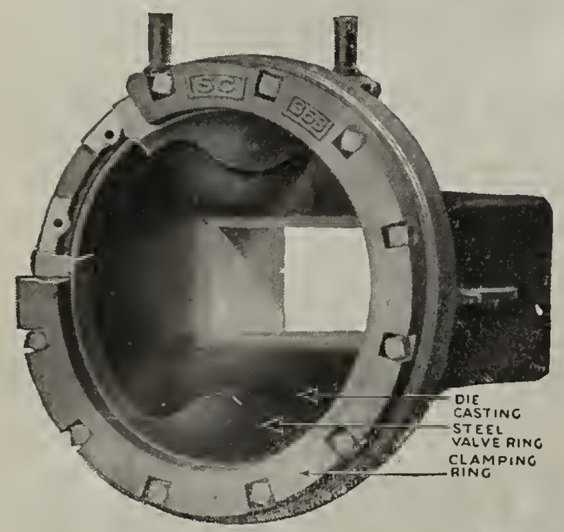
Chambers Brothers Co., Philadelphia, Pa.

Brickmaking Machines and Appliances of the Better Kind.

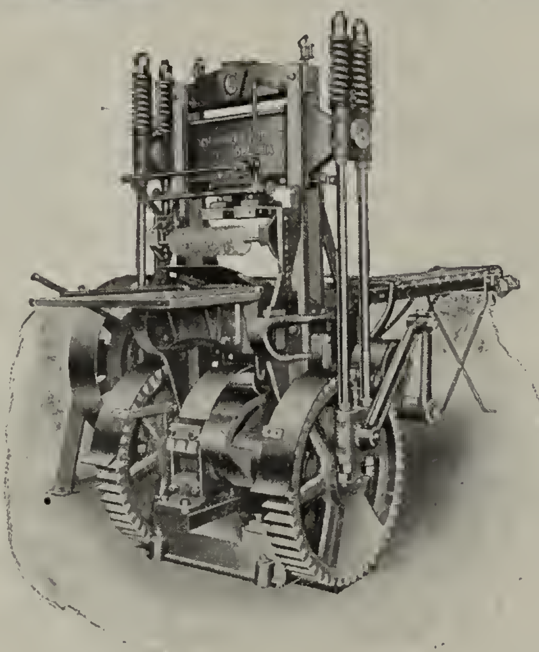


The Chambers Lubricating Die Helps on the Rattler Test.

The lubricant is applied at the point of greatest resistance and is forced into the die under pressure. Contributes to a more uniform movement of clay bar. Gritty shales and fire clays possessing but little plasticity are molded more succesfully with this die. Less power, less waste, better product. Used on various auger machines. Both side and end cut.

Lubricating Side-Cut Brick Die.

(Patented Feb. 24, 1903.)



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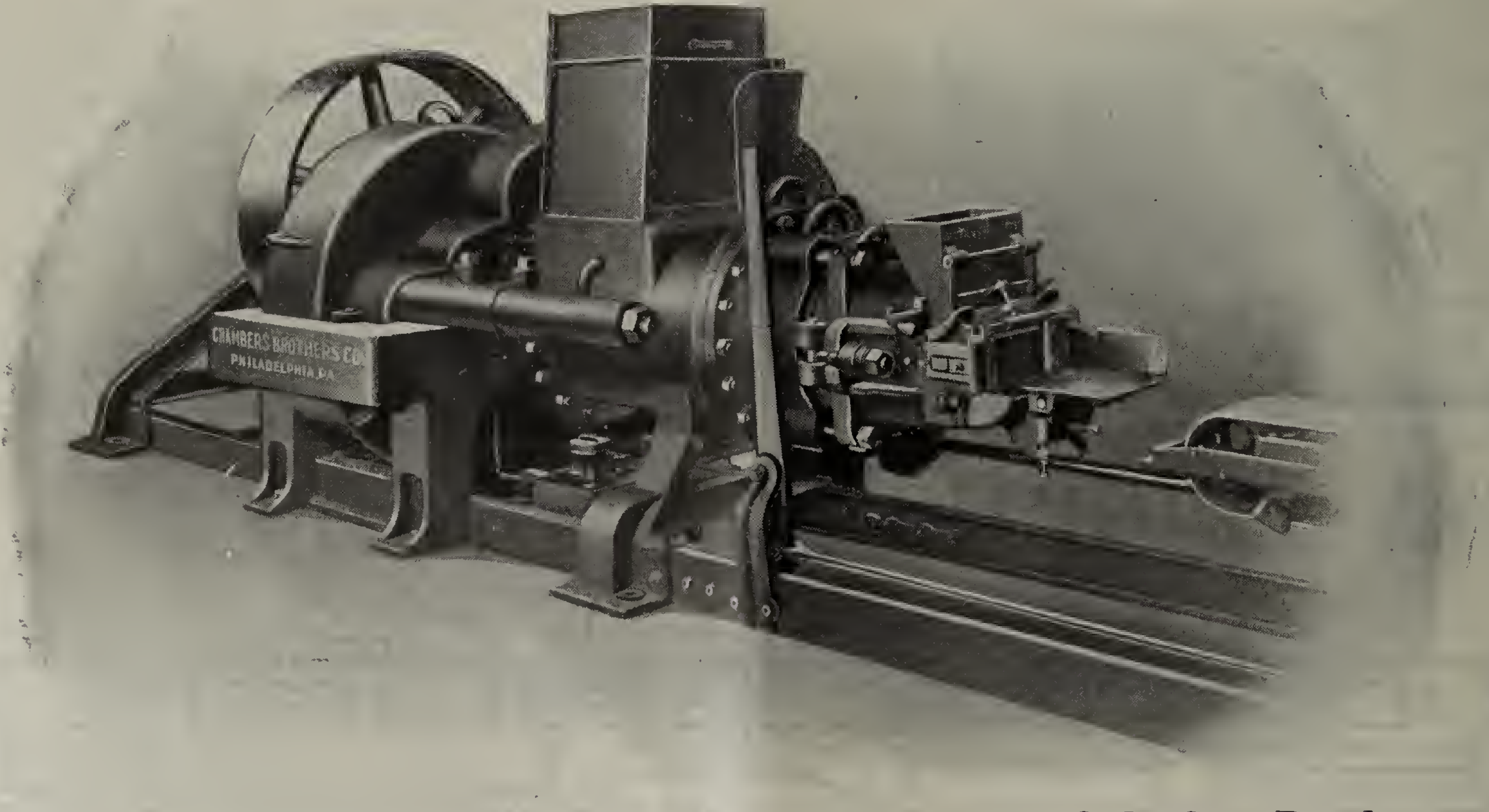
A strongly built Crank Press that has found favor with manufacturers of fire brick and furnace blocks. Closely built, with great stiffness in crank shaft.

All cross head slides of liberal dimensions. The feed mechanism is in perfect time and gives a smooth, easy movement to the finished product. Press built in four sizes for different classes of work.

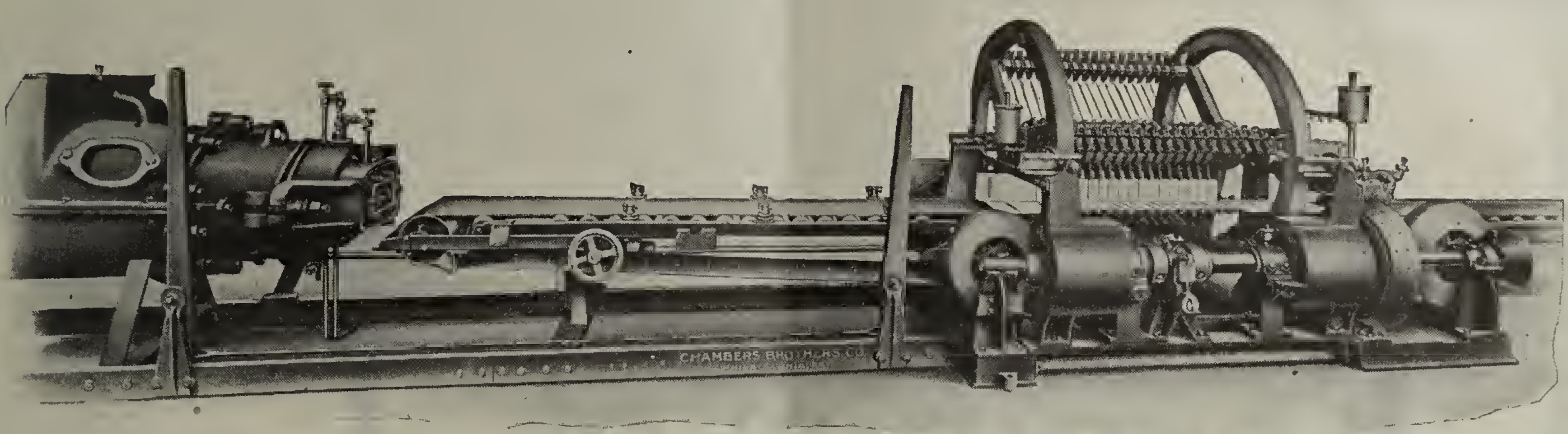


The Keystone Auger Machine---For End-Cut or Side-Cut Products.

Of great strength and large capacity. Single gear type. Gearing enclosed and running in oil. Journals lubricated by circulating oil system.

Chambers Brothers Co., Philadelphia, Pa.

Clayworking Machinery Developed
Through a Careful Consideration of the Criticisms of
Experienced Brick Manufacturers.



THE BRICK CUTTER THAT DOES NOT SWELL THE CLAY-BAR

Built so far as possible, to a standard for the construction of machinery of this class.

El Paso Brick Company

Pass-Tex Brick

By frost, nor flood, nor fire, nor even time are well burned clay products destroyed.

El Paso, Texas,
August 18, 1916.

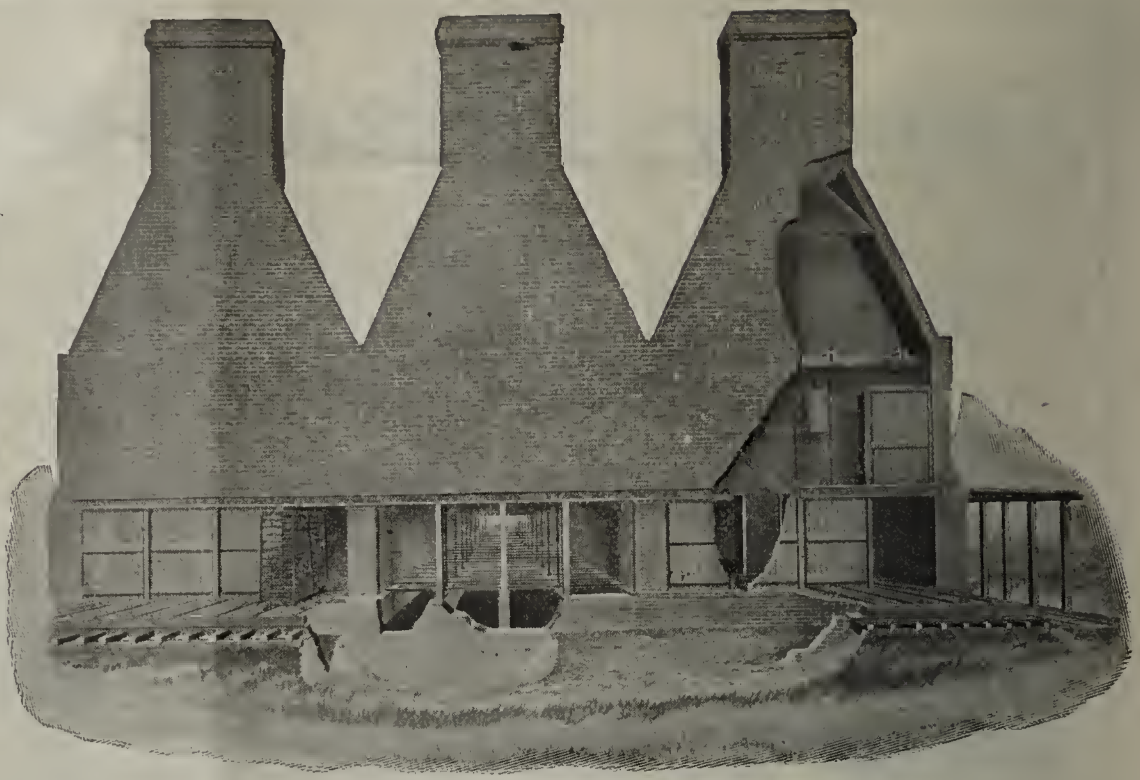
Chambers Brothers Co.,
Philadelphia, Pa.:

Gentlemen:

***We want to state that we are more than pleased with the way the Cutter has operated. We have given it a thorough test and find that it has more than made good on every claim made for it, and would be pleased to have you refer any prospective purchaser to us, regarding its merits.

Yours very truly,
EL PASO BRICK CO.
(Signed) E. Hewitt Rodgers, Sec'y.

Chambers Multiple Brick Cutter No. 10



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can be increased without increasing your production. Your profit-margin needs to be expanded. This can be accomplished by securing an improved quality of material from your drier.

THE STANDARD
Natural Draft Drying System

is producing remarkable results of this character at other brick plants and the cost of operation is exceptionally low. Upkeep expense is next to nothing, users write us.

Let us send you our catalog, with actual facts and figures. Let us tell you what we will specifically guarantee in your own case.

The Standard Dry Kiln Co.
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THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXVI. INDIANAPOLIS, IND., SEPTEMBER, 1916. No. 3

Written for THE CLAY-WORKER.

BACK TO TERRE HAUTE.

ANNUAL CONFERENCE AND INSPECTION OF BRICK PAVED STREETS AND ROADS—ON THE BANKS OF THE WABASH.

Paving Brick Boosters Will Congregate at the Deming Hotel October 5 and 6.

IN SONG and in story the famous fertile valley of the Wabash has become a household word the world over. History has been made there of great interest to the people, especially to clayworkers, for it was there at Terre Haute that brick paving was first accepted as an ideal pavement, a quarter of a century ago. Hence it is mete and proper for the master minds of the paving brick industry to assemble there and take their reckonings, recount their successes and plan for still greater achievements in the seasons to come. It was in this famous valley that clayworking was first undertaken in a large way in the greater valley of the Mississippi.

"On the Banks of the Wabash" is a sweet refrain which echoes a pleasing sentiment that has touched the heart strings not only of the folks at home, but of those who have wandered far from the beautiful valley. It was one of the latter who wrote this song so dear to the heart of every Hoosier. Fort Harrison and the Battle of Tippecanoe were bloodshed necessities for the advancement of civilization, and the valley of the Wabash has been prolific of men who have gained renown in fields of commerce and literature. Alice of Old Vincennes and George Ade, a contemporary character of today, are natural products of that

Engineer Blackburn Views with Satisfaction the Brick Pavement in Front of his Residence at Paris.

Down Fifteen Years Without Repairs and Still in First-Class Condition.

wonderfully rich country—rich in natural resources, rich in civilization, rich in character.

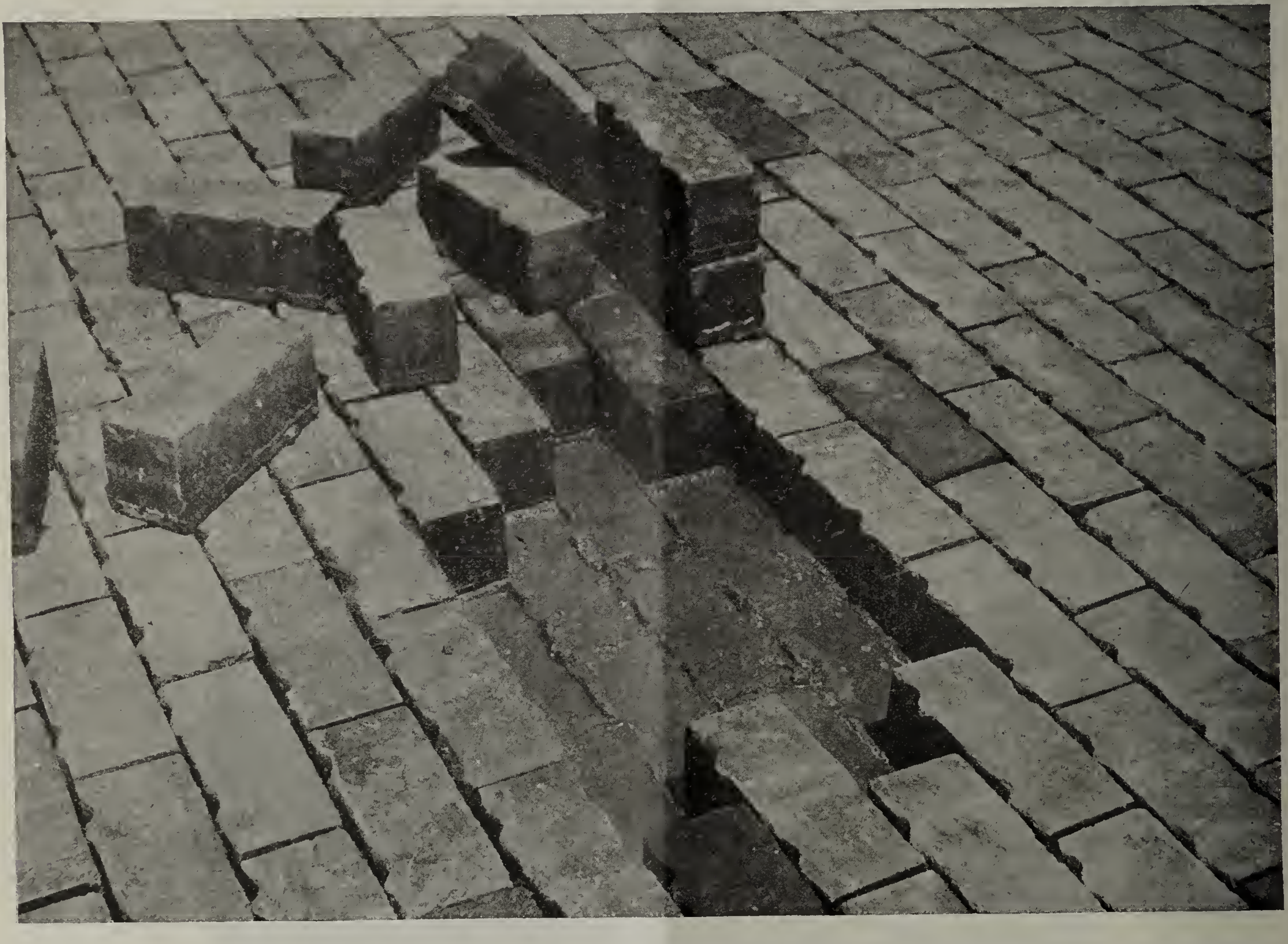
"Terry Hut," as seen by Riley, is the real Terre Haute. It is in the midst of this potent influence for progress that the National Paving Brick Manufacturers' Association has undertaken to show to the good people of the country the real economic advantages that must sooner or later be put into actual practice in giving to the public permanent highways, that will bring down the high cost of living and raise up to a point of common enjoyment rural social conditions needed for the betterment of the common people.

Here "On the Banks of the Wabash" is the practical demonstration of the excellence and durability of properly constructed brick pavements. Here is accessible practical information of the best methods of construction that will prove an inspiration to all who are interested in the betterment of our public highways. The program outlined will be a source of great pleasure and profit to all who participate.

In Terre Haute is the old-time brick-paved South Sixth street, that is known and recognized by every engineer in the country and by the students of highway improvements, due in part to Prof. Baker's mention of its quality and character many years ago, and it still deserves all the good things that have been said of it.

From Terre Haute the visitors will journey to Paris, Ill., a near-by city known for its tidiness. It is a brick-paved city, one of the best of its type in the country. So satisfactory have the city's streets proven that they are now being extended out into the country in all directions.

Paris will be the place of the construction demonstration on October 6. No more beautiful city of its size exists anywhere. There is no indication of extravagant luxury to be seen, as the name would indicate, but substantial comfort is everywhere apparent—a community of good sense. Besides what will be learned in road construction, the visitors will carry away with them an impression of stability and home comfort that will be remembered pleasantly always.



A Lesson in Construction: Note the Appearance of the Green Concrete Foundation After the Brick Surface Has Been Rolled.

Paris, Ill., is the home of W. T. Blackburn, one of the foremost paving engineers of the land, and to whose initiative is due in a large measure the introduction of the monolithic type of brick pavement, which for economy and efficiency is unequaled by any other paving material, especially for the improvement of country highways. Convincing proofs of these facts will be afforded those who attend the conference.

Program for the Conference.

The sessions of the annual meeting will take place at the Deming Hotel, Terre Haute, Ind., October 5, 1916, at 10 o'clock a. m.

The construction demonstration will take place at Paris, Ill., October 6.

The register will be opened at the Deming Hotel for both members and visitors on the evening of October 4, during the day of October 5 and the morning of October 6. All persons attending the conference will please register and receive programs, credentials, information, etc.

Every visitor attending the conference is requested to register. A reception committee will be on hand to respond to inquiries for details and information.

Every visitor attending the conference should plan to arrive, if possible, during the day or the night of the 5th, and in any event not later than 9 o'clock on the morning of the 6th.

Train service entering Terre Haute from all directions is excellent, steam as well as interurban.

Please do not be late, thereby causing delay in following out the program.

At 9 o'clock a. m., October 6, a short inspection trip will be made over some of the old Terre Haute brick-paved streets, particularly South Sixth street, made known to all by Professor Baker's mention of the same in his work on roads and pavements. The brick were plain wire-cut, constructed on a broken stone foundation.

At 10 o'clock a. m. the entire conference will go by interurban to Paris, Ill., at which place some of the older streets will be inspected. The visitors will then be conveyed in automobiles to the point of construction demonstration, which is to be the special feature of the occasion.

Paving a Country Road: Application of the Cement Filler—First Coat.

The round-trip fare by way of interurban will be 60 cents.

In the evening, on returning to Terre Haute, a banquet will be served at $2.00 per plate.

The number and character of persons already notifying us of their attendance warrants us in saying that no one interested in the cause of highway improvement can well afford to stay away.

No matter how large the numbers attending, the

The Deming Hotel, Terre Haute, Where the Paving Brick Boosters Will Congregate October 5 and 6, 1916.

Deming Hotel promises to provide for all, providing reservations be sent in. We will be pleased to do this for you on your instructions.

The Illinois Highway Commission will be on hand to cordially welcome us at Paris, Ill., and the Chamber of Commerce of Terre Haute extends a hearty welcome to all.

For further particulars the reader is requested to write to Wm. P. Blair, secretary of the N. P. B. M. A., Cleveland, Ohio.

CONVICT LABOR LOWERS COST OF CALIFORNIA ROADS.

The difficulties of building roads in the mountains are many. The transportation of supplies to the workmen, the construction of satisfactory quarters, and the execution of the work under the conditions of weather and topography existing in the mountains are so troublesome that contractors require stiff prices for such roads. In the mountainous counties of California, the State Highway Commission is now building highways very successfully with convicts. All through the snows and rains of last winter two gangs of 125 convicts, without armed guards, living in camps of unequaled character and living on food of unsurpassed quality for such work, labored away on a very difficult road through a mountain canyon. When the bad weather ended, it was found that the eight miles thus built cost one-fourth less than the engineers' estimate and a little more than half what similar work in the same locality had cost when done by contract. With the advent of good weather the cost became less. "There is no longer a question that convict labor is not only successful as a humanitarian measure," the commission reports, "but that it will make possible the construction of many miles of mountain roads that otherwise could not be built."

THE VALUE OF GOOD SURVEYS IN ROAD BUILDING.

Surveys for roads are often criticized as an unnecessary expense, mainly useful in giving temporary jobs to surveying parties. It seems to many people a very easy matter to stake out a proposed road so that the grades will not be too heavy and the curves too sharp. There are other things to be considered, however, as was recently brought out in some statements by John H. Gordon, president of the New York State Roadbuilders' Association. "The preliminary survey is too often made hurriedly or under adverse weather conditions, and when the actual construction begins the contractor finds that his work is radically different from his idea as derived from the plans and specifications. Final surveys of excavation and embankment at times show as great a discrepancy as 25 per cent, although no great departure has been made from the plans—a result scarcely excusable. The preliminary survey should be made with the utmost care and the plans and specifications drawn therefrom should be the subject of the most careful thought and study, and when finally adopted should not be lightly changed. The location of the material to be used should be

Main Lobby of the Hotel Deming, Terre Haute, a Fine, Comfortable Place for Button-Hole Talks.

definitely and exactly stated and the responsibility for these locations and quality of material should rest with the state. Should these sources of supply be exhausted or deteriorate in quality, it should be the state's burden to bear the loss, and not the contractor's."

AMERICAN MOTORS ON NEW CHINESE ROAD.

Consul Paul S. Reinoch reports from Pekin that, under the terms of an agreement for road construction just consummated with the governor of Pekin, and in return for furnishing a loan of $100,000 Mexican ($54,600 United States gold at present exchange in China), an American company has been granted an exclusive franchise for twenty years to operate motor freight and passenger services upon the road to be constructed. The highway will extend from the city of Pekin to the Western Hills (Summer Palace) by way of the Marco Polo bridge, and it is expected that its construction, by making the Hills directly and readily accessible to Pekin, will lead to the development of suburban residence areas in that region. It is understood that the building of this highway is only the first step in an extensive plan of public road construction in Chihli Province.—Exchange.

PEACE AND PAVEMENTS.

Some paving projects have been delayed this year by lack of labor, thus illustrating an argument used by this journal throughout the season of 1915.

Then business was relatively depressed. Today there is greater business activity than in many years. There is no such thing as a bad year in which to pave. Loss of time in waiting for an improvement is always a greater tax than the seasonal discrepancy in construction costs. One kind of year finds money scarce and enterprise dormant. The other kind of year finds communities optimistic, well financed and eager to improve, but hampered from the standpoint of labor.

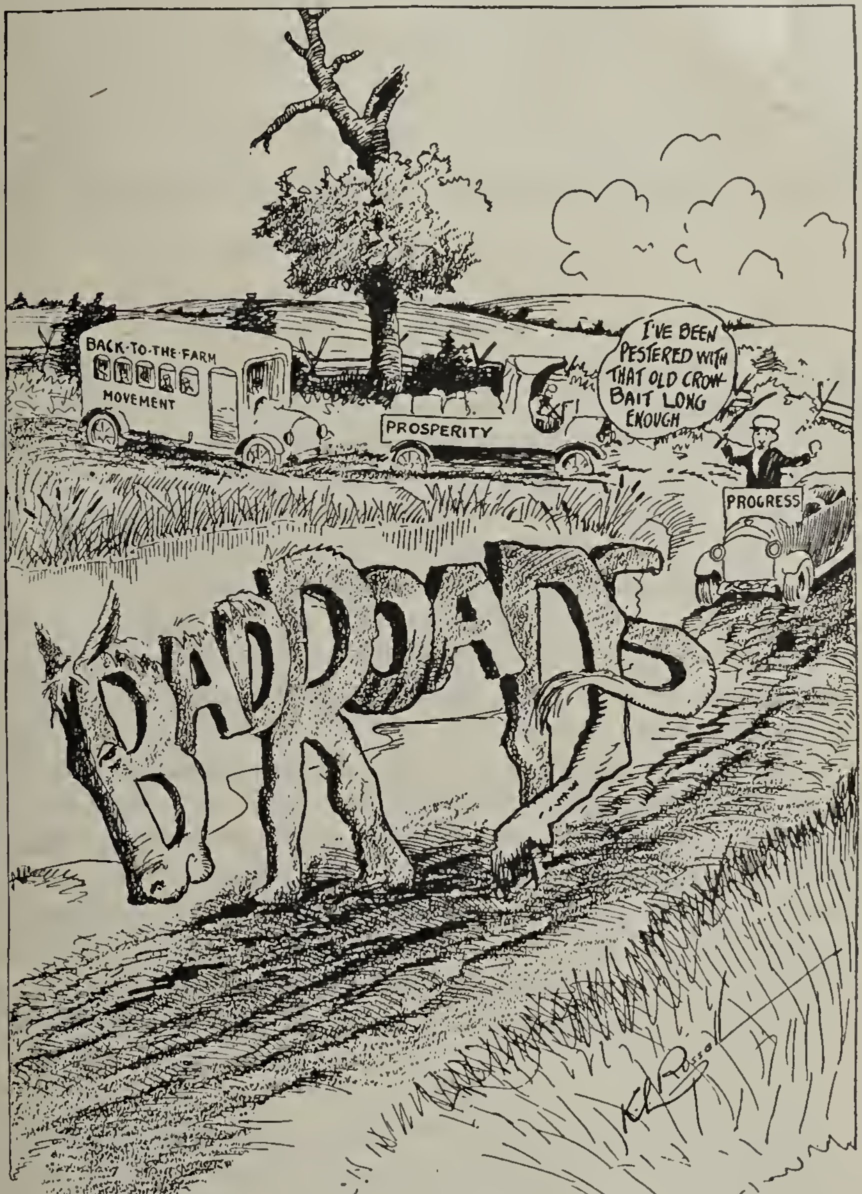
With conditions so acutely dependent upon world events, it would not be a bad thing for highway authorities to bear in mind the lessons of the last two years in making their plans for 1917. If the coming year is to find America undergoing the readjustments due to world peace, it will be more than an advantage, it will be a duty to employ the maximum number of men in public work, such as paving. Money is plentiful, and where, in a period of transition, will it find more secure investment than in public bonds?—Dependable Highways.

IF WE LIVED LONGER.

If the years of a man's life were seven hundred to a thousand years instead of three score years and ten, we should not merely live longer; we should live differently. We might or we might not do less "hustling," but in making our plans and in our productive activities we should emphasize less the day by day interests and the immediate return. We should think more painstakingly of the future. We should forecast. We should build substantially, and probably to a greater extent than a short-lived mankind does, we should pay in advance.

These considerations go far to explain the intensity of our individualism, the nebulousness and nervelessness of our public-mindedness. We are selfish, of course. Altruism is of slow growth, and these hindrances to a life of generous citizenship are magnified by the sense of the shortness of our active existence. Every ambitious man knows that the success or failure of his career turns upon the concentration of his business or professional exertions for fifteen or twenty years. Relaxation, attention diverted from profession or business to public service in any form, may mean personal disaster and the ruin of family fortune.

When, therefore, a man like Mr. Elihu Root warns us that after the European war is over public-mindedness and public service will be not merely exemplary, but also imperative, we find ourselves asking just how we are to get them. Addressing the American Bar Association as its president, at the annual meeting held in Chicago last week, Mr. Root attributed a defective administration of law in America, which we all deplore, to an unconscious habit that the legal profession has acquired of regarding the administration of justice as something to be done for private benefit instead of primarily as something to be done for public service. This habit, in turn, he attributed to our highly developed individualism, with its respect for the sancity of individual rights and the correlated conception of government as designed to secure such rights. Inevitably the lawyer, if he is an honorable man, becomes loyally devoted to his client's interests, and little by little he loses sight of the public view of judicial procedure.


BACK-TO-THE-FARM MOVEMENT
PROSPERITY
I'VE BEEN PESTERED WITH THAT OLD CROW-BAIT LONG ENOUGH
PROGRESS
BAD ROADS

IN THE WAY

A Cartoon Which Appeared in the September "Better Roads and Streets."

Beyond question, Mr. Root is right so far, but will he tell us, or will any one tell us, how, in the stress of business and professional life, we are to break away from our individualism or subordinate it to a sense of public responsibility if our economic system remains as individualistic in organization and in functioning as it is at present?

The other day we called attention to the function of monarchies and aristocracies in thinking and building for the future, which democracies are not interested in. The individual short-lived man is as little interested in it as is the democratic mass. In the nature of things it is only a long-lived organism that can be interested in it. A kingly dynasty is such an organism. Less perfectly an aristocracy is such an organism. Would a socialistic society be such an organism? Who is wise enough to tell us?—The Independent.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

CHAPTER IV.

Feldspar.

FELDSPAR HAS been noted as one of the common minerals in clay. The potash feldspar—orthoclase—is probably most commonly found in clays first, because it is more abundant in granite rocks; and, second, perhaps because it may resist weathering influences in greater degree than the other feldspars.

Feldspar enters largely in ceramic bodies as a fluxing mineral, and it is a desirable mineral in any clay body. With pure clay it does not develop any eutectic mixture and its effect as a flux is more or less proportional to the advance in temperature.

The fusion temperature of commercial potash felspar is listed by different authorities from cone 4 to cone 9, but in ceramic bodies it undoubtedly develops mixtures fusible at lower temperatures. Cone 4 to cone 9, however, are not unusual temperatures in commercial kilns, even on common wares, and feldspar must be ranked as an important mineral in clays in the development of a permanent bond and in vitrification. Fortunately, it is a safe material for this purpose.

Carbon.

Carbons occurs in clays as vegetable matter, such as rootlets, mould, etc.; as bituminous matter high in volatile gases, such as lignite, bituminous coal, oil and oil residues; as non-volatile carbon, such as graphite. It also occurs as a mineral constituent as in carbonates.

Carbon plays an important part in the burning process, and it is often the cause of considerable trouble, though in limited amounts it may be beneficial.

(1) To whatever extent it is present in the clay it may assist in the burning, and indeed it is frequently added to the clay for this very purpose.

(2) It retards the oxidation of iron, and because of this factor we often get into serious trouble.

(3) It produces a porous product.

The Hudson River district and Chicago are noted examples of the use of carbon for no other purpose than to assist in the burning. In one locality coal dust is added to the extent of a little over one per cent of the clay, and the double coaled product which is for casing, etc., has about thirteen per cent of coal.

Sawdust is frequently used, but more especially to increase the porosity of the product. Coke, anthracite and semi-anthracite are the usual types of coal added to clays, and they are generally safe, while bituminous coal, because of the volatile gas, the rapid combustion, and the relative high temperature developed are likely to cause bloating and black coring. Lignite is used in a number of localities and has proven to be excellent material in spite of the fact that it is highly gaseous.

These materials, under proper control, not only aid in the burning, but they serve as "grog" to reduce lamination.

The serious difficulty of carbon in clay is its retardation of the oxidation of other minerals. It is a reducing agent, and until it has been burned out there can be no oxidation of the other minerals.

If the combustion of the carbon is rapid and it develops temperatures sufficient to fuse the clay in contact with the carbon, bloating and black coring result. The carbon can only burn when supplied with air, and the fusion of the clay mass produces an impervious body, thus shutting off the air supply. The intensely heated carbon will take oxygen from any minerals in the clay mass containing oxygen and the gas thus developed being unable to escape forms bubbles or blebs, increasing in size because of the expansive force of the gas under advancing temperatures.

In burning carbonaceous clays it is necessary to remove the carbon at low temperatures, which means at a slow rate, since the carbon itself may develop a fusing temperature in the clay mass.

There are many carbonaceous clays which cannot be burned in the ordinary manner. The black shales in Ohio and the black cretaceous clays in New Jersey are examples of clays difficult to burn because of their carbon content. As soon as the carbon in the clay becomes ignited it burns at such a rate as to produce fusion and the result is the same as if the clay had been badly overburned in the ordinary way. In burning such clays the first step is to heat up the mass by furnace fires until the carbon in the clay is ignited, then the fires are drawn or allowed to die out, the furnaces are closed up and daubed, thus shutting out the air supply, except that which may leak in through the walls, and because of the reduced air supply the combustion of the carbon is very slow and high temperatures do not develop in consequence. After the carbon is thus burned out the furnaces are again put into use and the kiln burned off in the usual manner.

The bloating is due entirely to the gas in a fused mass, and the black core is partly due to unconsumed carbon and partly to reduced iron in combination with silica forming a black iron silicate.

The black color of a clay is not proof that the clay will be unsafe in its burning behavior. The clay may be refractory and resist the fusing tendency of the carbon, or the carbon may be of such character or in such condition that it will not develop a fusing heat.

All that can be said is that a black clay must be regarded with suspicion until it has been proven to be safe burning.

Iron Minerals.

Iron is a very common mineral in clay and also in many products very important. It occurs in a number of common mineral forms, such as oxides, carbonate, sulphide, sulphate, and as a constituent of silicate minerals.

The oxides are of first importance. Clays and shales may be red or yellow near the surface, changing to blue in depth, and these colors are largely due to iron, particularly the red and yellow. The red ferric oxide—hematite—is the most permanent form and the most common, and to it we owe the red color of our ceramic products. The yellow is a hydrous ferric oxide—limonite—which burns to red. The blue may be ferrous oxide, but the presence of some carbon would give the blue color in greater degree than iron. There are some very red clays in which the red color is said to be due to an algae and the raw clays are a deeper red than the burned product.

Such clays are not common, however, and the ordinary red clays burn to a much deeper red than the raw clay, except they also contain lime. The depth of the red color in the burned product in any case is due, first to the amount of ferric oxide present or produced in the burning, second to the degree of fineness and dissemination through the clay mass.

If we soak a mass of white burning clay with a strong solution of ferrous sulphate, dry and burn it, we will get a brilliant deep red color; if we mix the clay with powdered hematite ore, introducing the same amount of iron ore as before, we will get a brownish red color, but far less deep and less brilliant than in the first instance. If we use iron scale, iron sulphide, or metallic iron in granular form, the amount of iron still the same, we will have a buff product speckled with black spots.

The sulphate of iron is readily soluble, and in solution it penetrates to all parts of the clay mass, and when the water is driven off each grain of clay is coated with a film of iron sulphate which dissociates at a low temperature to ferric oxide and thus a maximum color effect is obtained from a minimum quantity of iron. The powdered ore and clay are merely a mixture and may be likened to a "pepper and salt" effect—at least to red pepper and salt, and the coloring effect of the iron is greatly reduced. Larger grains of iron ore or iron will produce red or black spots, but the natural color of the clay predominates.

The thin film of sulphate readily oxidizes to the ferric state and the surface of a grain of iron also will oxidize, but the oxidized outer face protects the inner core from oxidation and the result is a more or less brown color, due to the close association of the black ferrous and red ferric oxides.

Sulphites of iron burn black because the sulphur prevents the oxidation of the residual ferrous oxide, and the latter easily combines with silica to form a black silicate.

Iron sulphide—pyrite, marcasite and pyrrhotite—introduces a troublesome problem in burning clay wares, and hardly a clay is entirely free from this mineral.

It occurs most frequently as a concretion varying in size from granules, invisible to the naked eye, to lumps an inch or more in length. In this granular form it has little effect in producing color, even though in the burning process it becomes ferric oxide. Ware will often come from the kiln with a flaked or "popped" surface, and in the center at the bottom of each disc will be a red, brown, or black mineral grain. This mineral grain is the residual of pyrite or iron carbonate granule.

There is a reduction in volume of these minerals in the dissociation stages, but the shrinkage of the clay mass closes up the space. In the subsequent oxidation of the iron mineral the increase in volume in consequence of oxidation often exerts enough pressure to flake off the surface of the ware in circular discs within the radius of influence of the pressure.

The sulphur in pyrite begins to pass off at very low temperatures, but the evolution does not become rapid until a temperature of about 700 deg. F. is reached, and above this temperature the rate of expulsion increases with the temperature up to about 1300 deg. F., but we cannot completely drive off the sulphur at this temperature. The "blue smoke" from a kiln stack is evidence of the sulphur coming off, and we have seen operations where the temperatures were advanced by stages holding the temperature constant at each stage until the "blue smoke" became very light, but which again became heavy with an advance in the temperature.

The sulphur comes off at all temperatures and there are some dissociation temperatures where the expulsion is particularly heavy, but we know that in many instances some sulphur remains in the ware up to the highest kiln temperatures.

In this dissociation behavior of iron sulphide lies one of our serious burning troubles.

After the ware reaches the fusion point, the sulphur gas still coming off but unable to escape, bloats the ware. If the grains of pyrite are near the surface the bloating effect will develop large blisters on the surface of the ware. The effect of pyrite in clay has been admirably shown by H. B. Henderson in a paper on "Clay Testing," read before the National Brick Manufacturers' Association at the annual meeting, February, 1916, and published in The Clay-Worker in the following March.

We have mentioned the bloating on account of carbon gas, and sulphur gas, or any gas, will have the same effect under similar conditions. The sulphur blebs are likely to be larger than the carbon blebs because the pyrite granules are often larger than the carbon grains and a larger volume of gas is developed in the immediate vicinity of the granule.

Bloating, or vesicular structure, occurs in many clays when the temperature in burning is carried too high, and while it is due to a gas formation it is not always sulphur or carbon gases. In fact, very few clays fuse quietly to a dense glassy body.

In the fusion process as the different minerals enter the fusion mixture there is a chemical change taking place and frequently a gas given off in consequence. For example, ferric oxide—Fe 2O3—enters into combination with other minerals only after it is reduced to ferrous oxide—Fe O—and in the reduction, or in the reaction or fusion which combines the ferrous oxide and silica, one molecule of oxygen is given off.

Two things are happening at the same time, namely; a mineral which does not readily enter into a fusible mixture is being converted to one which does act as a flux, thus producing or aiding fusion, and a gas is being given off which entrapped in the fused mass causes the vesicular structure.

The behavior of lime is another example of vesicular development.

The fusion of minerals which in fusing do not give off any gas would be quiet and there would be no bleb structure. Such minerals would tend to have a very long, safe vitrification range within the clayworkers' definition of the term, while on the other hand clays that develop a large volume of gas in fusing and at the same time greatly increase the fusibility of the fusible mixture by the addition of other minerals would have a very short vitrification range. There are all degrees in between these two extremes.

(Continued on page 276.)

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give a paper read at the 1915 convention of the American Ceramic Society.

A STUDY OF THE ATTERBERG PLASTICITY METHOD.*

By C. S. Kinnison, Pittsburgh, Pa.

A METHOD FOR MEASURING plasticity is described by Albert Atterberg,† which is based upon the varying physical behavior of clays with different water contents. As we add water in increasing amounts to a clay powder, says Atterberg, the clay assumes first a condition where it can be made to hold together by pressure, then the state where it possesses its best working qualities, passing into a sticky condition, and finally is as a thin, watery fluid with an excess of water. The various clays assume any one of these conditions within varying limits of water content. For instance, if a clay is very plastic there is a considerable range in the water content within which it remains workable, while one whose plasticity is feeble permits only of a narrow range in its water content. If we determine the limits of the water content, according to Atterberg, at which the various clays pass from one condition to another, we have a valuation of their relative plasticities.

Atterberg classifies the condition of a clay with varying amounts of water into five different states, as follows:

1. The upper limit of fluidity, or the point where the clay slip flows as water.
2. The lower limit of fluidity, or flow, the "fliess-grenze," where two portions of the clay mass can be made to barely flow together when placed in a shallow dish and sharply rapped with the hand.
3. The normal consistency of "klebe-grenze," the condition in which the clay is most workable, is no longer sticky and will not adhere to metal.
4. The "ausroll-grenze," or rolling limit, the point at which the clay can no longer be rolled into so called threads, between the hands and the surface on which it may rest. This is the lower limit of the workable condition.
5. The point at which the damp clay will no longer hold together when subjected to pressure.

According to this classification, it is apparent that the workable stage is limited by the boundaries of condition No. 1 and condition No. 2, or in other words, a clay is workable between the point where it will barely flow (where this point is determined by the method mentioned above) and the point at which it can no longer be rolled into threads. It is Atterberg's contention that the wider this range the more plastic is the clay. It is clear that the establishment, or fixing of these points is arbitrary. The method adopted by Atterberg is as follows:

The Flow-limit, or Fliess-grenze.

About five grams of the clay powder, of approximately 120 mesh, are put into a small porcelain evaporating dish and made to a paste by the addition of distilled water. By means of a polished nickel spatula, the mass is shaped into a smooth layer, a trifle less than 1 cm. (.39 in.) in thickness. The clay is then divided into two portions by cutting a triangular shaped channel through it, as shown by Fig. 1, the lower edges being separated a trifle.

The dish is then repeatedly and sharply rapped against the heel of the hand in order to bring about the flowing together of the mass. The limit has been reached when the two portions of the clay barely meet at the bottom, thus as shown by Fig. I. If the paste is too thick, or too thin, water or clay is added until the proper consistency has been attained.

The water content at this consistency is then carefully determined by drying to constant weight and is expressed in terms of percent of the dry weight of clay.

The Lower Plasticity Limit, or Ausroll-grenze.

Clay in the stiff plastic condition is rolled on paper to form "threads" of clay. These are broken, put together and again rolled out. It does not matter if the threads break up into smaller lengths. Clay powder is then added to the mass and thoroughly worked and again rolled into threads. The limit has been reached when the threads crumble down. The water content is determined at this point and expressed in terms of percent of dry weight of clay. This figure subtracted from the one determined above is called the "plasticity number," and the higher its value the more plastic is the clay.

In this connection a revised adaptation of a method originated by Bischoff was used, in which the clay is mixed with varying amounts of sand of different fineness, 0.2 to 0.06 mm., and the effect of such additions on the plasticity studied. Atterberg's method consisted in adding to the clay powder fine sand, in the ratio of clay to sand as 1:05, 1:1 and 1:2. The flow limit, the sticky limit, or "klebe-grenze," and the "ausroll-grenze," or the point where the clay can no longer be rolled into threads, were then determined in these three mixtures. If the mass at the flow limit, could not be rolled into threads; it was considered as non-plastic. Those clays which could be mixed with two parts of sand without losing their plasticity were considered as belonging to the first class, those which could carry only an equal part of sand were put into the second class, while those which, upon an addition of half their weight of, or practically no sand, lost their plasticity, were classed third. The results of this experiment showed that the shape of the sand grains was of much more influence than was their size.

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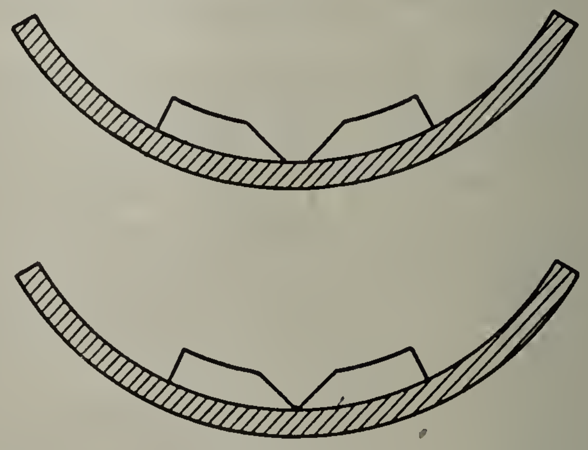
FIG. I.



These experiments on nineteen different clays showed that: If a clay, with a lower water content at the normal consistency than at the flow limit, be mixed with much sand, the relative position of the water content at the condition of normal consistency is always raised, in reference to the flow limit, and in some cases, rises above it, which shows that the condition of normal consistency cannot be considered as the upper-plasticity limit. In these cases, however, where the water content at the normal consistency lies above that at the flow-limit, then the latter must be considered as the upper limit of plasticity.

Figure 2 illustrating type curves will show more clearly the relations between the flow-limit and the condition of normal consistency, for the clays of the different plasticities.

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*By permission of the Director of the Bureau of Standards.

†*International Reports on Pedology*, 1911.

The diagram shows that these three conditions stand in the following relations to each other: The flow-limit and the rolling-limit coincide in the case of the loams, which Atterberg classifies as non-plastic, but in the case of the clays, they separate more and more as the plasticity increases. These two limits must therefore be considered as bounding the consistencies within which the clay is plastic.

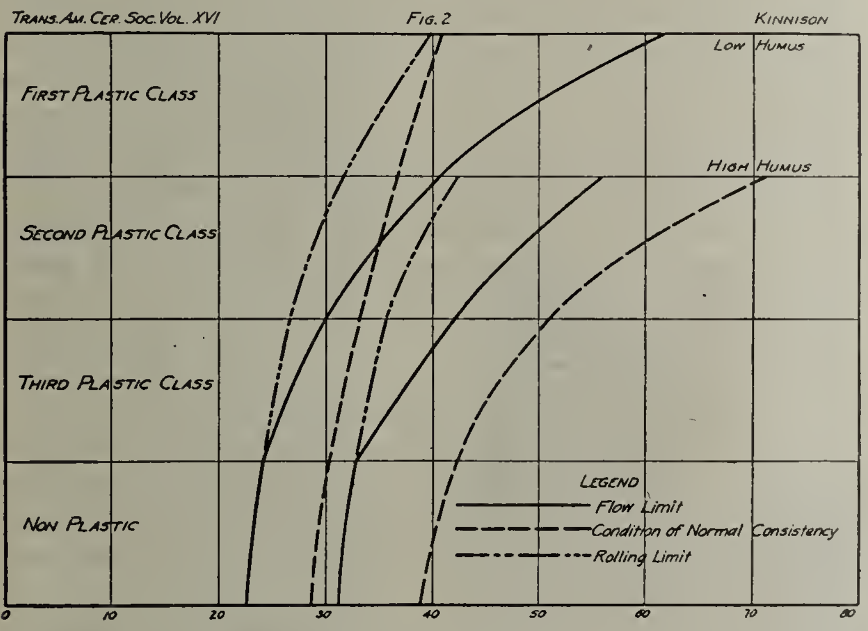
The curve showing the condition of normal consistency or "klebe-grenze" follows a decidedly different course, however. In the case of the loams, or "non-plastics," and the clays rich in humus, this limit lies much higher than that of the flow limit.

In the clays low in, or free from humus, the relative position of the flow limit is higher. In the class of highest plasticity, the condition of normal consistency always takes a place below that of the flow limit and approaches more and more the rolling limit, practically coinciding in the clays of highest plasticity.

The condition of normal consistency or the point where the clay is no longer sticky cannot, therefore, be considered the upper limit of plasticity. The flow-limit, rather, must form the upper boundary line of the plastic condition.

It is interesting to note that the condition of normal consistency and the flow-limit approach each other in the less plastic clays, coinciding in the second class, from which point they diverge.

FIG. 2



Since, however, the condition of normal consistency in the case of the clays of the first class falls between the flow limit and the rolling limit, two types of plasticity must be recognized, viz., the condition of sticky plasticity and that of the non-sticky. The failure to appreciate this distinction has been the cause of failure of so many of the methods of determining plasticity, says Atterberg.

Although the condition of normal consistency often lies outside the field of the true plastic condition, it still lies within the plastic area in the case of the most plastic clays, in which cases it forms the boundary line between the conditions of sticky and non-sticky plasticity.

Experiments were made on about 25 different clays, with and without sand, representing the four classes of plasticity, to determine the flow limit, the point of normal consistency, and the rolling limit.

The water content at the condition of normal consistency in the clays of the first plasticity class is always lower than that of the flow limit, while in the clays belonging to the third class and in the loams, the water content at this consistency is always higher than at the flow limit. In the clays mixed with sand the water content at the condition of normal consistency was always higher or in the neighborhood of that at the flow limit. A clay showing a lower water content at the condition of normal consistency than at the flow limit is rather difficult to work. The addition of rather large quantities of fine sand or small quantities of organic material will raise the relative position of this point in reference to the flow limit, and therefore makes them more workable.

The Atterberg method, while perhaps not so well known in America, is being used to some extent in Germany for classifying the clays according to their plasticity. The method is practically as simple a one as could be devised, and if it represents facts, it is well that we should become familiar with it.

To compare it with some of our methods for measuring plasticity, twenty different clays were selected, and their water of plasticity and volume shrinkage determined, as well as the amount of water which the dry powders would absorb when allowed to stand over a dilute sulphuric acid solution, a method recommended by Keppler. It is not to be expected that the clays would be classified in the same order by all three of these methods, but from the combined results of these tests, we should be able to classify them rather accurately according to their relative plasticities, inasmuch as they are all directly related to this property of the clay.

The clays used were as follows:

TABLE I.

1 Bedford shale
2 G. A. Murray shale
3 McKeehan shale
4 Metropolitan shale
5 Deckman-Duty shale
6 Galesburg shale
7 Kittanning fire clay
8 Union Furnace fire clay
9 Chicago Retort and Fireclay Co.
10 M. and M. ball, No. 11
11 Tennessee ball clay, No. 3
12 Great Beam ball clay
13 Whitaway ball clay
14 M. W. M. china clay
15 M. G. R. No. 2 china clay
16 Ault. No. 3 fire clay
17 Georgia kaolin
18 North Carolina kaolin
19 Texas white clay, 340
20 Florida kaolin

In determining the volume shrinkage each clay was worked to its best consistency, which corresponds to the "klebegrenze" in Atterberg's work. This condition was merely judged by feel. The clays were then put into a humidor and allowed to stand over night when they were removed, and small cylindrical pieces of about 50 cc. contents made for determining the volume shrinkage, the volume measurements being made in kerosene. The water of plasticity was also determined.

These pieces were dried by a method similar to that recommended by Kerr and Montgomery, viz., air drying for about five days, then drying to constant weight at 75 deg. and finally taken to complete dryness at 110 deg. C. The pieces were then dipped in paraffine and their volume determined. Column A of Table II shows the results:

TABLE II—DATA.

Clay	A Shrinkge	B Water Plast.	Water Absorbed	Flow Limit	Rolling Limit	D Plasticity No.
1	21.7	21.7	5.21	29.8	18.3	11.5
2	23.9	21.9	3.34	28.4	18.7	9.7
3	15.7	17.6	2.20	24.6	16.4	8.2
4	15.0	20.6	3.33	28.9	20.2	8.7
5	15.5	20.0	4.27	27.6	20.7	6.9
16	21.5	18.6	4.79	25.6	15.8	9.8
7	18.8	17.1	3.20	24.3	14.9	9.4
8	20.9	20.8	3.82	27.0	17.6	9.4
17	18.5	25.5	4.71	39.3	26.2	13.1
18	18.8	27.4	4.75	36.1	29.5	6.6
6	17.2	21.1	2.43	27.0	20.0	7.0
9	16.4	15.3	4.90	21.3	13.0	8.3
10	32.5	33.0	10.50	54.7	27.1	27.6
11	35.3	34.4	10.30	50.0	30.4	19.6
12	26.0	31.2	7.84	41.2	29.8	11.4
13	25.9	30.5	7.22	43.9	26.3	17.6
14	21.3	30.6	2.19	40.5	32.7	7.8
15	20.0	30.2	2.51	39.1	31.7	7.4
19	45.0	39.3	20.90	75.4	35.1	40.3
20	24.3	31.1	5.68	45.5	29.8	15.7

For determining the water absorbed the specimens were subjected to the vapor tension of a 10 per cent H_2SO_4 solution.

(Continued on page 278.)

Observations of a Pacific Coast Clayworker Traveling East.

An Interesting Story by One of Our Scribes Who Made a Tour of Investigation of Clay Plants from Oregon to New York.

AFTER MUCH PLANNING, the long anticipated trip East of your Pacific Coast scribe finally took on shape, suitable routes and data were carefully studied and with the good help of our friend the ticket agent, we were assured that we did not need to hasten our arrival at destination, nor our stop-overs. We were told that we could get off the train anywhere and everywhere en route, and that we would have no trouble whatever, and we can assure the reader that we took advantage of this privilege to the fullest extent, and it makes travel across the continent very much easier than heretofore.

We were making this trip principally to study the clayworking industries and to obtain first handed information as to how we could improve our own products and methods of operations. Anything made of clay, therefore, attracted our attention. In the far Northwest, clay products are used sparingly. Here and there are brick buildings. Hollow tile appears to be used to great extent, for at intervals we observed warehouses along the tracks and close to stations, all of hollow tile construction. We detected in the distance as we were speeding east, here and there a silo; close observation revealed the fact that it was a hollow tile silo. So our farmer friend is probably some agricultural college student and knows the advantages of clay tile over our wood and concrete competitors.

Butte, Mont., was our first stop. The city is built on the western slope of the Rocky mountains. Clay products are used to a very great extent here. Court house and jail built of face brick and white glazed terra cotta. Some of the streets are paved with brick. We observed also that the sewer system is put in with segmental section glazed hollow tile. Inquiries among friends told us that there were some large plants in that section of Montana. Butte itself maintains two common brick plants and also a face brick plant. Helena has a large clayworking plant, where they make all kinds of clay products, common brick, face brick, paving brick, much resembling Fiske's "Tapestry' 'brick. However, the Anaconda Copper Company is maintaining a large brick plant, and the same company has a large fire brick plant at Anaconda. So the clayworking plants are well represented in that section.

Pocatello, Idaho, presents a very busy appearance for a small inland town. Large signboards tell us the annual payroll of this town is $1,500,000. It boasts a new union depot, built entirely of clay products, faced inside and out with brick, much resembling Fiske's Tapestry brick. However, this brick was made locally and is good in texture and varied in color. Uncle Sam has a large postoffice there, built of clay products mostly, we are told.

Ogden, at the head of Salt Lake, is a good brick town; has two large brick concerns, which are making common and face brick, some fire brick and a great deal of hollow tile. Mr. W. H. Child, of the Ogden Press Brick and Tile Company, was our guide through his plant. His common and face brick were formerly all made on dry presses, but since last year this method of making has been changed and large Fate machines are now making face brick, drain tile and hollow tile. Here climatic conditions are evidently not as severe as on the Pacific Coast, for everything is dried in the open air. Even their large continuous kiln has no roof.

The Aston Fire Brick Company, also of Ogden, is building a new plant. This plant is under the management of Mr. J. B. Calhoun. A large brick stack, 190 feet high, 9 feet inside diameter, for kiln purposes, will give the reader some idea of what western clay plants are doing. A complete dry press brick plant, well arranged, all electrically driven, and also complete hollow tile plant embracing the latest combination Fate machines, brings to our mind that we out West are not so far behind the times, anyway.

Salt Lake City is next reached. A drive in a sight-seeing automobile gives us an idea of the city in general. Beautiful residences of fire flashed face brick. Hotel Utah entirely faced with white glazed terra cotta; apartment houses occupying a whole city block, using 10,000,000 brick in their erection, all attract the clayworkers attention. We made up our mind that this would be a good clay town, and with evidently some good plants, so we arranged to make the general rounds. The Utah Fire Clay Company makes everything in clay from common brick to white glazed enamel brick, sewer pipe, fire brick and silica brick, and the young man in the office told us (the management being absent) that they also make magnesite brick. Mr. H. Jungk, manager of the Improved Brick Company, represents the German talent. He told the writer he is doing business according to the rules of the demand and supply, and is able to make some money when the times are good, and does not lose much when times are dull. He makes face and common brick in different shades.

At the invitation of Mr. J. P. Calhoun, we visited the Salt Lake Pressed Brick Company's plant at Wilford, which was the old name; the present name for the locality is Sugar House. Several large, tall brick stacks, visible some miles before we get there, gave an inkling of the extent of the plant. Upon arrival we found two large continuous kilns with dry press equipment for common and face brick; farther, a complete stiff mud plant for making common brick and hollow tile. Two large, open-top continuous kilns, each 580 feet long by 30 feet wide, having a capacity of 3,580,000 brick, take care of the production of the stiff mud plant. The kiln is set and drawn with overhead crane setting system. We gasped at the enormous size of the plant and equipment, and as the foreman proceeded to give us some more data, we made up our mind that we actually have some up-to-date and enterprising concerns in our great West. The foreman told us that the Fate hollow ware machine is making 30,000 blocks, 4x8x12, equal to 125,000 brick per day. The setting machine handles 2,000 brick at a clip. Wonderful and very satisfactory results. When asked about the amount of coal used, we were unable to get the information, as the waste heat of the kiln was also used for drying the ware. The dried product is therefore very black in handling, and a complete bath house has been installed for the benefit of all employes. SIWASH.

(To be continued.)

MOVIES AND SCHOOLS.

In the city of New York alone, one-half million people see motion pictures every day, while only one-fifth more persons attend the formal schools from kindergarten through university. The best figures obtainable indicate that one person in five in the United States sees motion pictures every day. Only one person in five in the United States is supposed to attend the public school system. Twenty million people see motion pictures every day. In all the educational institutions 1912 there were enrolled 21,102,113 people.

Just plain folks discover that the motion picture takes everywhere to them; that it destroys for them the otherwise galling limitations of time, space and circumstance. It gives them, not pictures, but actual transcripts of life as it is and life as they want it to be. Do we wonder that overnight the motion picture has become a great teacher? Or perhaps the great teacher? That we hail it as the greatest aid to education since the invention of printing.—Warren Dunham Foster in address to several thousand educators at New York.

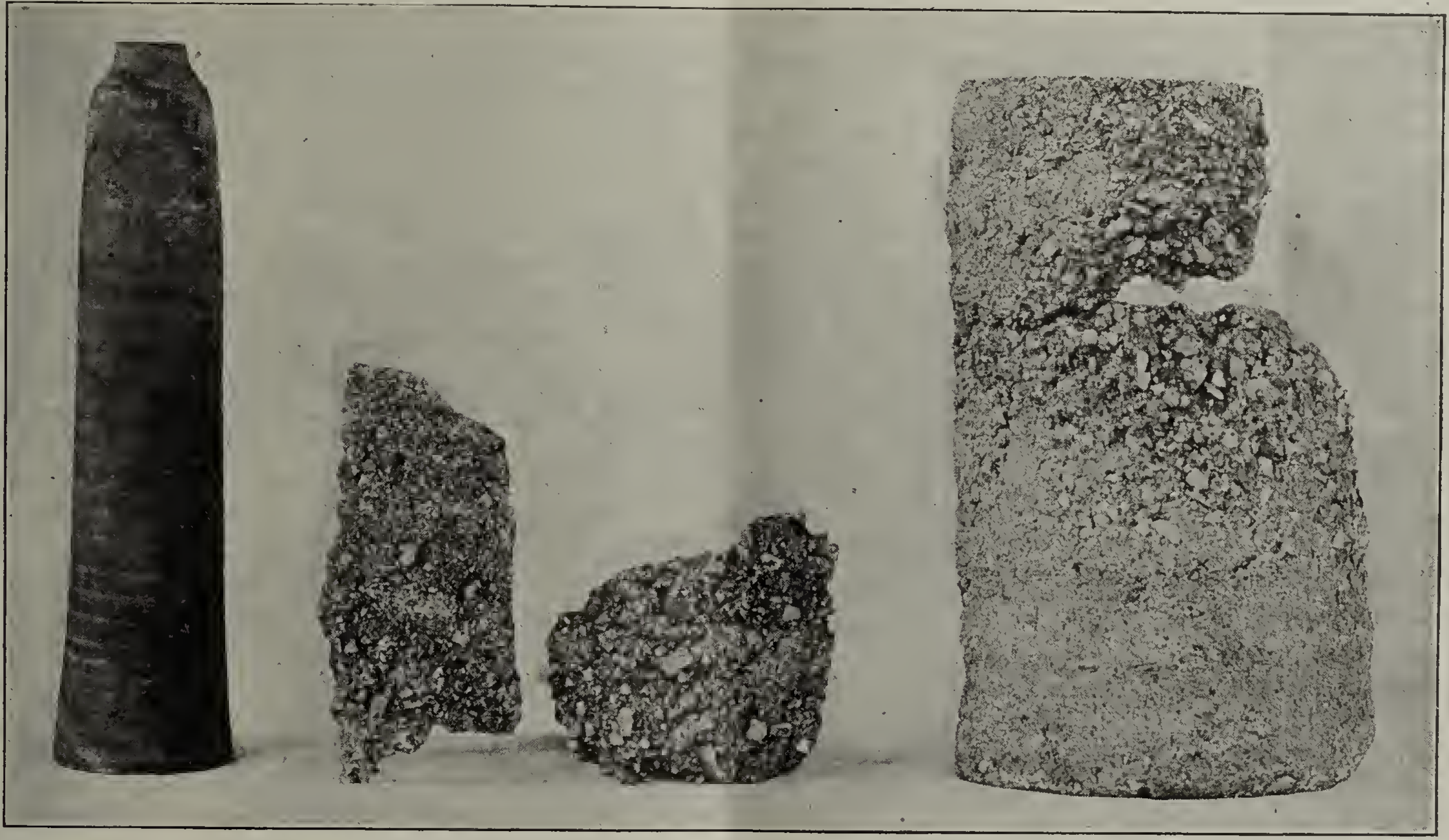
A GRAPHIC ILLUSTRATION OF THE SUPERIORITY OF BURNED CLAY OVER CEMENT.

WE ARE pleased to publish herewith a photograph made of two interesting drain tile, one of clay and the other of cement, or rather what was left of the cement tile. In this picture it is easy to distinguish between the clay tile and the disintegrated cement tile.

Mr. George Fries, a tile manufacturer of Connersville, Ind., furnished us with this tile and the following information. This tile was made in 1838 by a potter, who threw same on his potter's wheel, surface clay being used. This tile was used at Blooming Grove, Franklin county, Indiana, in a system of tile used to convey water from a spring to a distillery a distance of forty rods. This information was given to Mr. Fries by Dr. George Berry, of Brookville, who died at the age of ninety in 1890. The doctor through his practice saw the potter working at this job ,so he was able to give the facts regarding same and designate the exact spot where the tile could be found in 1885. Mr. Fries remembered this information and a year ago made an investigation and discovered the system still doing duty in conveying water from this spring to the site of the old abandoned distillery. In the illustration you will note that the upper end of the tile is small. This was made so purposely, in order that it could fit snugly into the next tile.

The three other pieces in the picture are parts that remain of a cement tile which had been in the ground only one year. Note in the large piece the hole that was made simply by the action of the water. The tile is a thin shell around this hole. The tile disintegrated badly for it could not stand the alkaline condition of the soil.

This is indeed a graphic illustration of the superiority of clay tile over cement tile. We could cite many other such cases.



On Left is Clay Tile Over Eighty Years Old in Perfect Condition. The Other Three Pieces Are of a Disintegrated Cement Tile Which Lasted Only One Year.

Written for THE CLAY-WORKER.

HEARD IN NEW ENGLAND.

CONNECTICUT BRICKMAKERS have been undergoing considerable difficulties in securing help. The shortage was so serious that Richard B. Murray, of the Murray Brick Company, Berlin, went to Virginia for the purpose of finding employes. While his journey did not yield as well as he hoped, it did well enough to enable the firm to fill its orders. Others have been less fortunate, however, and are still suffering from a shortage of labor.

All over Connecticut demand for brick has been heavy this season, much heavier than ever before, and makers have had trouble in keeping up with their orders. Building operations have surpassed all recent years, not alone in one city, but in nearly all.

The Purinton Company, of Waterville, Me., has a number of important contracts to fill yet this season. They are for considerable sized building operations, which, for some unexplained reason, began late. They are going ahead now, however, and the projectors hope to have them finished by winter. But this means that the brickmakers must hurry, too, and they are doing so.

Proctor & Bowie, of Winslow, Me., are reported to have large orders on hand, which include brick for a number of large building operations in that vicinity. They have felt the shortage of labor less than some of the makers farther south, yet even Maine has suffered to some extent for the same reason.

While no detailed statement of individual manufacturing firms has been heard from New Hampshire, general information is to the effect that business has been good there all the season. Perhaps it has been the best season, as a whole, the New Hampshire manufacturers have enjoyed in many years.

The Hampden Brick Company, of Springfield, Mass., undoubtedly represents the Massachusetts manufacturer, and all reports from there are to the effect that they have had an exceptionally good business this season. A number of mills in that vicinity erected important additions and other development work was undertaken which gave them a large amount of desirable business. Because of this the situation is good, so far as they are concerned. They expect a continuation of the same prosperous conditions next year.

Dyer Brothers, of Greenfield, Mass., is another firm which has been operating to capacity this season. It prepared last fall for a good business and was not disappointed. Demand began as soon as the spring opened, and it has continued unabated to the present. Greenfield has gone forward pretty fast this season, and the probabilities are that it will continue to expand in the season to come.

Maybe in some respects the development in Vermont has exceeded anything else in New England. Building began in all its principal towns as soon as spring opened, and it has continued ever since. Because of this every brickmaker in the state has been busy. Those who had a surplus found a ready sale at a distance, while those who had no surplus found that they could dispose of more than they could make at home. The situation is promising for a continuation of the same volume of business another year. HIRAM.

CHIMNEY CONSTRUCTION.

PROPER CHIMNEY construction is a mighty important thing. We get some idea of its importance when we are told that the worst single cause of fires in every state in the Union is defective chimneys, including flues and stovepipe connection.

According to the statistics of the National Board of Fire Underwriters, on an average over one-fifth of all the dwelling house fire lossses are due to defective chimneys, and sometimes the ratio is as high as one-third. It naturally follows therefore that proper chimney construction is one of the most important items in home building. For the benefit of the building world, the National Board of Fire Underwriters has set forth in its book of dwelling houses, which is a code of suggestions for construction and fire protection, many important definite points about what may be termed standard chimney construction, illustrating the subject matter with detailed drawings.

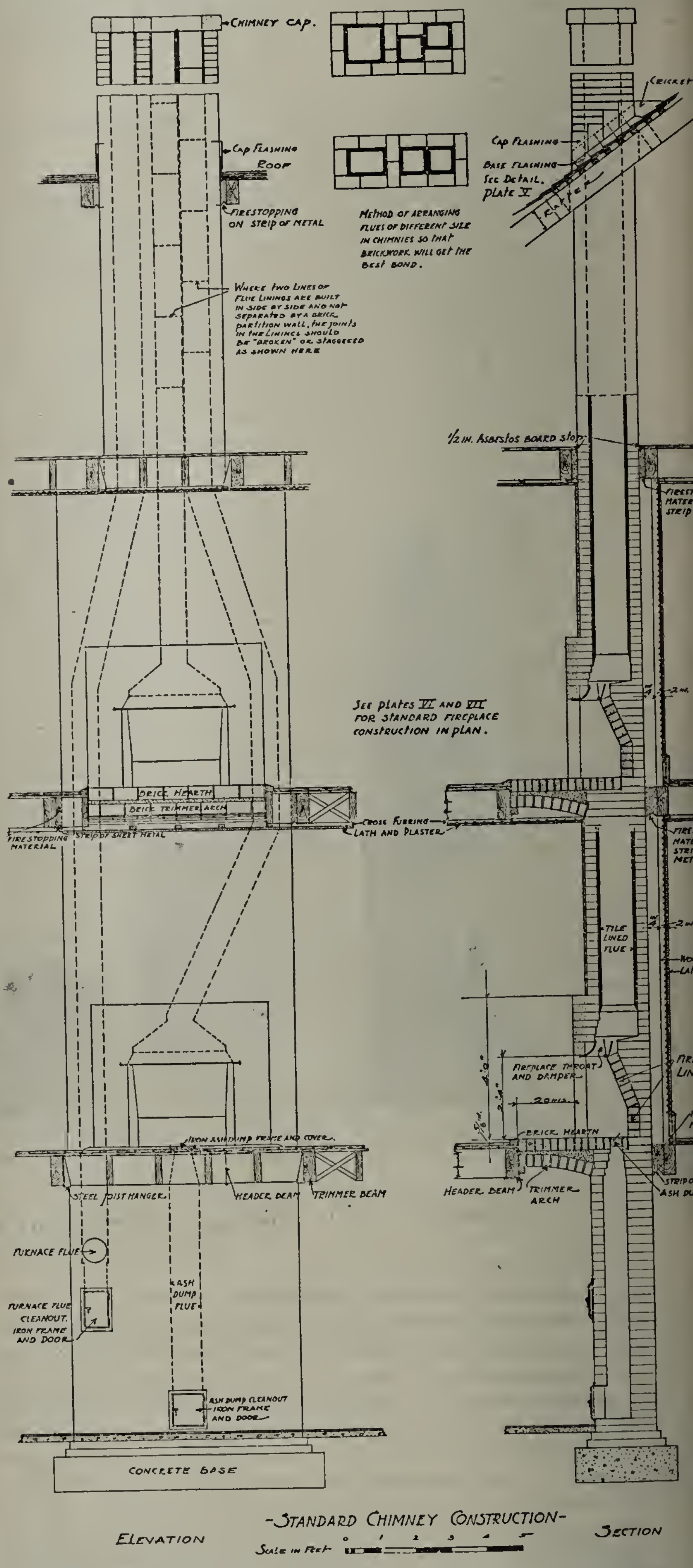
One of the points emphasized in this connection is that all chimneys and flues should be lined with fireproof flue lining, made specifically for the purpose. It is claimed that the use of sewer tile or other clay or concrete tiles for chimneys is dangerous because they are liable to crack on account of unequal expansion.

Another point worthy of special note in this connection made by the same authorities is that concrete blocks should not be used in chimney construction unless they contain substantial steel re-inforcement running around the blocks, with the shell of the blocks not less than four inches thick.

To put it another way, the use of concrete blocks in chimney construction is not recommended by the National Board of Fire Underwriters. They recognize that blocks suitable for this purpose are made by some manufacturers, but they say it is an unfortunate fact that the majority of this product used in the construction of chimneys is quite unsuited for the purpose. The concrete is not properly mixed, properly cured or something, and the element of chance is so strong that concrete chimney building is frowned upon by those who have made a study of the subject from a fire risk standpoint.

This means, to state it another way, that nothing else compares with good brick for chimney building. Those who become enthused over concrete for a while and are still inclined to push concrete for chimney construction are on the wrong lead, because facts have demonstrated that a properly constructed brick chimney is the best chimney that can be built.

And now to go back to the subject of linings for a minute. Flue linings are an important thing in chimney and flue construction. That means properly linings made of fire clay, usually one inch thick and without collars. They must be built in, as the chimney is constructed and set in a cement mortar, with the joints struck smooth on the under-side. Other linings than those made of fire clay for this specific purpose are liable to crack or disintegrate from the action of flue gases and crumble, therefore the flue clay lining is the proper thing, and it should start from the bottom of the flue or from the throat of the fire place and continue clear through.


CHIMNEY CAP.
CAP FLASHING
ROOF
FIRESTOPPING ON STRIP OF METAL
METHOD OF ARRANGING FLUES OF DIFFERENT SIZE IN CHIMNIES SO THAT BRICKWORK WILL GET THE BEST BOND.
WHERE TWO LINES OF FLUE LININGS ARE BUILT IN SIDE BY SIDE AND NOT SEPARATED BY A BRICK PARTITION WALL, THE JOINTS IN THE LININGS SHOULD BE "BROKEN" OR STAGGERED AS SHOWN HERE
CRICKET
CAP FLASHING
BASE FLASHING SEE DETAIL, PLATE V
RAFTER
1/2 IN. ASBESTOS BOARD STOP
SEE PLATES VI AND VII FOR STANDARD FIREPLACE CONSTRUCTION IN PLAN.
BRICK HEARTH
BRICK TRIMMER ARCH
FIRESTOPPING MATERIAL
STRIP OF SHEET METAL
CROSS FURRING
LATH AND PLASTER
TILE LINED FLUE
FIREPLACE THROAT AND DAMPER
20 IN.
BRICK HEARTH
IRON ASH DUMP FRAME AND COVER.
STEEL JOIST HANGER
HEADER BEAM
TRIMMER BEAM
HEADER BEAM
TRIMMER ARCH
FURNACE FLUE
FURNACE FLUE CLEANOUT. IRON FRAME AND DOOR
ASH DUMP FLUE
ASH DUMP CLEANOUT IRON FRAME AND DOOR
CONCRETE BASE
-STANDARD CHIMNEY CONSTRUCTION-
ELEVATION
SECTION
SCALE IN FEET 0 1 2 3 4 5

Elevation and Section of an Interior Independent Chimney, Showing Recommended Construction. Extra Flues Can Be Added as Desired.

Sometimes masons are inclined to neglect lining a chimney and flues properly except when they get into the straight part of the flue. This it is claimed makes the flue dangerous at its hottest point and the linings should be fitted and extended throughout.

In proper chimney construction no more than two flues should be permitted in the same space; that means no more than two flue linings adjoining each other. Chimneys are built containing more flues, but where there are more it is best to separate these flue linings by at least one thickness of brick wall between. In fact, the best chimney construction really calls for the separating of each individual flue lining from the one adjoining by at least a thickness of brick.

Where chimneys are not lined it is imperative that they be eight inches thick, and the best chimney of large size for service where there is considerable heat is one eight inches thick, properly lined. Some people in some places have a habit of building flues for stoves with brick set edgewise. This is dangerous practice and should not be tolerated. No flue should be thinner than a thickness of brick plus the thickness of flue lining and the mortar between. This should be the minimum, and where the flues are large and considerable heat in the gases the brick wall should be eight inches or two brick thick instead of a single brick.

All chimneys should properly be built from the ground up, and no flue should be carried up on a bracket or wooden beams.

All chimneys should extend at least three feet above a flat roof and two feet above the ridge of peak roofs, and be provided with a proper capping of stone, terra cotta or cast iron.

Unless brick chimneys are capped at the top or the top brick tied together in some manner the mortar joints may loosen by the action of the weather and in time loosen up, which makes air spaces through the chimney, and not only reduces its efficiency but it also makes it easier for the chimney top to be torn off by a hard storm.

The one place where cement enters to advantage in chimney construction is in the making of mortar. Portland cement mortar is admittedly superior to lime mortar, not only in holding quality, but also in resisting the action of heat and flue gases. Lime mortar disintegrates in time and is liable to fall out of the joints, thus producing a hole through which sparks may find a way and fire originate. There are some building laws which specify that cement mortar only be used for the foundation of the chimney and for that portion exposed to the weather above the roof. This helps some, but not enough. Building regulations really should specify that at least the entire inside of the chimney exposed to heat should be built with cement mortar. This will add a little more to the cost of construction, but it is well worth it.

BIRD HOUSES MADE OF CLAY.

Harris M. Benedict, of Cincinnati, Ohio, who has achieved a wide reputation as the result of his endeavors to work up a sentiment in favor of protection for wild birds, has been recently granted a patent on a bird box which has a number of novel and interesting features. In the first place, it is of a deep pitcher-like shape and made of fire clay, which can be readily shaped while in the plastic form. The surface may be made to simulate the bark of the tree. The bark-like finish makes it particularly desirable for the birds, as these feathered visitors are known to avoid anything in the way of a home that is too conspicuous. This bird box has the usual exit and entrance orifice near the top, with a raised waving line inside, by which the little birds may help themselves to the entrance when this assistance is required. Another novel feature is the sloping lid with an overhang to protect the interior from being flooded by storm, as well as a deep flange to prevent it from being dislodged by the wind. By means of this lid the bird lover may watch the progress of his tiny charges.

Written for THE CLAY-WORKER.

SEEN IN NEW JERSEY.

FROM ALL THE manufacturing centers come continued reports of good business. If they could have obtained all the labor they needed they could have disposed of a good deal more brick than they have. But prices remain around $8.00 and tend upward rather than downward; consequently, they haven't much to worry about. If they had a surplus on hand, as they have sometimes at this season, they might feel different, but for the present they can rest assured that their busines will continue good, at least through this season.

Herbert Merhoff, of the Merhoff Brick Company, Little Ferry, was set upon by thugs while going to the works with the money for the payroll, beaten and robbed of $1,800. The hand which held the money was so badly injured in the struggle that it will be partially useless. The thieves have not yet been apprehended, nor has any clue been obtained of them.

The Hackensack district has not turned out as many brick this season as it used to. The manufacture has been profitable, but the pits are getting deeper and deeper, and the cost of securing raw clay has been getting heavier each year. Therefore, the expense has more than kept pace with the returns, and the manufacture has been reduced at some of the plants. Others have operated to capacity, or as near it as the labor scarcity permitted. Sales are made now at about $8.00, and orders on hand will carry out everything left. Building growth has been very heavy of late.

In and about Newark the demand for brick has become so heavy that it is difficult to keep them supplied. The opening of a canal between New York and Philadelphia will be a help in some ways, but will not entirely solve the problem. Shipments both by rail and water are required to maintain the supply under present conditions, and unless they come both ways a shortage develops sooner than expected.

The Architectural Tile Company has been incorporated at Keyport, with a capital stock of $150,000. The object of the company is to design and manufacture all varieties and grades of architectural terra cotta and tile work.

The National Fireproofing Company has been making numerous improvements at its plant at Lorillards. Several additions to buildings were made, and a new steam shovel at the clay beds has superseded one which has been in continuous operation about thirty years. The plant's business is unusually good, and capacity operation is essential to keep up orders.

Around Perth Amboy, makers of both brick and fireproofing are wondering whether they will be able to deliver all the stock ordered for shipment this fall. That is their most difficult problem. What is wanted is some means of turning out their products in larger volume and at lower cost; yet the cost this season has really made but little difference. Every plant is running to capacity, and buyers are paying the prices without question.

At Trenton, it is said that every pottery is operating on full time and every bench is occupied by a skilled workman. And this is true, despite the fact that buyers have been taking hold liberally all the season and are still buying. It is hard to fill all orders as quickly as wanted. Every type of pottery made is sharing in the activity, which manufacturers say is the best they have ever known. A. L. B.

If you are making brick but not hollow tile, and your trade wants some of the tile, the right thing to do is, anticipate these wants and get a line of tile to sell yourself—not wait for somebody else to do it.

An Enduring Memorial

A MEMORIAL devoid of the quality that will make it enduring, isn't much of a memorial after all. That is why the American Clay Machinery Company has been so enthusiastic in advocating the building of the Lincoln Highway of brick. There is no road building material which will, if properly used, build such a dependable road as brick and surely Abraham Lincoln is worthy of the most lasting memorial we can build.

Here around Bucyrus, Ohio, we are using brick for building country roads and city streets. We have used brick for over thirty years and many of our brick streets have been in use for thirty years without repairs. That is why we have advocated brick for the Lincoln Highway and that is why the Lincoln Highway through this county is being paved with brick.

Lincoln Highway Painters on Bucyrus Brick Paved Public Square.

In Camp on Brick Country Road, Bucyrus, Ohio.

All through Ohio brick predominates on the Lincoln Highway, in fact, nearly seventy-five miles of this highway in Ohio are already brick paved and more are to be built next year. Ohio is bound to do Lincoln honor in building a permanent highway so far as permanence in highway building is possible. In this we ask the co-operation of paving brick manufacturers, engineers and contractors because without their co-operation even brick roads are not permanent.

The picture on the cover of September issue of The American Clay Magazine shows the Lincoln Highway to the west of Bucyrus. The Lincoln Highway east out of Bucyrus is also being brick paved as well as three miles of country road, making over seven miles of continuous brick through Bucyrus and vicinity on the Lincoln Highway.

In another part of same issue is printed three photographs showing other views of the Lincoln Highway in the country east and west of Bucyrus. Two Bucyrus men, Rupersberger Bros., secured the contract for painting the Lincoln Highway marker on the telephone poles from New York to San Francisco and the photograph shows the men at work, in camp, and on the brick paved public square at Bucyrus.

Automobile Squad Painting the Lincoln Highway Signs.

All these views are taken on brick paved roads and indicate the attitude of this community toward the solution of the good roads problem.

BRICK ROAD FAILURES.

The brick men should insist on the best type of brick road as in some states where there are road engineering departments the specifications are not what they should be. In Ohio, right here in our own county, brick roads have gone wrong just because they were improperly built. Roads have scaled off within a year after construction and on examination we have found that the grout filler did not penetrate to the full depth of the brick allowing expansion on the under side of the brick and holding the top surface rigid, causing the brick to scale. We tested a lot of the bricks which were claimed to be faulty and in every case they were of best quality. The fault was clearly with the construction and yet the brick got the blame. The American company took care to have the truth known and popular favor in this community will be held for brick in spite of various disappointments, but in another community where there was not sufficient interest on the part of any one to get to the bottom of the trouble, brick roads would have gotten a very bad set back. In other instances in our own community no provision was made for expansion and the pavement bulged up. This was clearly an error in specifications and it should be remedied. There is little use and no judgment in laying a brick road in such a way as to make it almost certain to go wrong; every failure is much more of a hinderance than a help. And so we repeat that the brick interests should ascertain just how a brick road should be put down and should see that those specifications are not only adopted, but that they are rigidly followed. The onward movement toward brick roads will be retarded just so long as this precaution is not taken. If we need expansion strips along the curb and expansion joints across the road we ought to adopt them at once and see that they are used. If we need a bituminous filler instead of grout to stop disappointments, then that filler should be adopted and used. Competition is too keen to make it advisable to assume an air of superiority and allow the disappointed people to suffer from errors of construction from which we should have protected them. If we know how brick roads should be built to insure that satisfactory use which we claim for them, we ought to see that those specifications are followed. If we do not know how brick roads should be built then we ought to find out without delay as a protection to the industry as well as to the public. Brick roads, properly built, will unquestionably give the long and satisfactory service we claim for them and there is no one more interested in the proper building of the brick road than the manufacturer of paving brick. Why not all of us join hands in giving the world the best type of road it has ever known, using brick, brains and honest construction as the component parts. The American Company stands ready to join the brick men in any movement toward the justification of our frequent and ardent championship of brick roads.—American Clay Magazine.

THE ROOFING BUSINESS.

THE ROOFING TILE branch of the clayworking business is one of the minor branches, small enough in comparison of value of the annual output that it would not be deserving of a great deal of attention from a journal covering the entire clay working industry were it not for the fact that there is plenty of room for it to grow into a much bigger industry and become a business of much greater magnitude than it is. It is because of this fact that The Clay-Worker has persistently taken up this subject periodically and agitated it. The Clay-Worker has a natural desire to see every branch of the industry thrive and grow to full size, and for that reason busies itself industriously to seek out and set forth opportunities for development. Sometimes the work is a bit discouraging because the response is slow in coming, and the effort seems largely wasted. However, persistence is a good thing and usually bears fruit in time.

There is a two-fold reason for taking up the roofing tile business right now. One is because of the situation in the roofing material business in the country that makes exceptional opportunities to exploit tile, and the other is because the roofing tile business has seemingly been running on slow speed in the matter of progress and needs a little stirring up.

By referring to the detailed report of the clayworking industry for 1913, which was a pretty good year all around, we find that the total roofing tile output for that year was valued at $1,130,286. Of tile other than drain it thus became third on the list of importance, being exceeded in point of value by wall tile and floor tile. The production of wall tile for the same year was $1,763,992, and the production of floor tile was $2,483,082.

Only 24 plants reported as making roofing tile. These were located in the States of Alabama, California, Colorado, Georgia, Illinois, Iowa, Kansas, Kentucky, Michigan, Missouri, Ohio, Pennsylvania and West Virginia.

This would make it less than two plants to each State reporting, but, of course, they were not divided up in this way. Ohio was the principal State producing roofing tile, turning out more than 41 per cent. of the total. Strange to say, Kansas was the next State in point of importance, with California third.

It may be said in passing that Ohio was the leading State also in flooring tile, but New Jersey and not a Western State was second in point of importance.

There is not only a strong contrast here to clayworking conditions in Europe, where nearly every brick yard makes and sells roofing tile along with brick, but it is evident that the roofing tile end of the business has not been exploited or pushed as industriously as either wall tile or flooring tile. There is plenty of room for further expansion of wall tile and floor tile, and we expect to see considerable progress, especially in floor tile, during the next few years. Neither of these though have a field with anything like the excellent opportunities for large expansion in the trade that is furnished by roofing tile.

The roofing business of the country calls for about 13,000,000 squares of shingles, somewhere between a half million and a million squares of slate, and no one knows just how much metal and composition roofing. It is easily evident, however, that the roofing business is big enough that burned clay roofing tile, which is admittedly the best roofing of all, has hardly made a start toward capturing anything that looks like a volume of trade.

In the pioneer days, when shingles were all the go, cheap and easy to obtain and no serious thought was given to the fire hazard, there was excuse for roofing tile making slow progress and shingles having the call, but that excuse doesn't exist today. Shingles are being replaced rapidly now with other material, but clay tile is not playing an important enough part in this other material.

Composition shingle roofing which has been extensively exploited for some time is making more inroads into the roofing business right now than any other offering for this purpose. It is to be found replacing both metal roofing and wooden shingles, which of itself is evidence that the people are looking around for a better roof.

As a rule, the composition shingle roof is not a cheaper roof than the wooden shingle, nor the plain metal, though metal is rather high at this writing. It is cheaper than slate in most localities, but it seems to be making its headway because it is exploited for quality and guaranteed in many instances for a period of ten years. The guarantee may not be worth much, but whether it is or not, it is evidently helping sell the product.

Talks with people of experience in the roofing question, whether they are exploiting wooden shingles or something else, brings out the general admission that burned clay tile is the best roofing of all. Architects voice the same opinion, and it is easy enough to convince the home builder of this fact. Why more burned clay tile is not being used at the present time it is a little difficult to understand.

One reason why more home builders do not use clay tile roofing is that it is difficult to secure promptly in many localities and pretty expensive. This suggests that more of it readily available would help the cause considerably, and after studying over the situation The Clay-Worker feels impressed with the thought that we not only need more extensive exploitation in roofing tile by those in the business of manufacturing at present, but we need more factories and a wider distribution of them. Somehow we are not able to get away from the idea that every manufacturer of building brick should take an interest in this subject to the end that some of them here and there may be possessed with a desire to enter into the manufacture and distribution of roofing tile right along with building brick. Somehow we believe there is a solution to the problem right here, and that some day we will get at it right and make the roofing tile business an industry of magnitude such as it deserves to be in this country.

Written for The Clay-Worker.

AMONG PHILADELPHIA BRICKMAKERS.

COLLECTIVELY SPEAKING, the Philadelphia brick manufacturing and distributing industry at this time presents what must be said to be a pronounced picture of brick activity. Good business has been the basis of existing conditions covering the past several weeks, and, in fact, the past several months, so that in practically every instance the local yards have had a sufficient volume of business to necessitate the fullest operation possible during this period.

Producers of building brick of various grades have been the recipients of the heaviest demand in and about this section of this state, with the sewer brick manufacturers running them a good second as to the comparative amount of business received to date. Both these branches of the brick industry have experienced noteworthy increases in demands this year, and one particularly gratifying phase of the situation is that sewer bricks frequently have been given the preference over their old rival, concrete. The only trouble that has been experienced in this respect has been that the demand for sewer brick has been so heavy that the manufacturers here have been practically unable to produce sufficient quantities of this product to meet the demand, and thus in some instances concrete has been used where it might not otherwise have been entertained, even in the light of a suggestion.

The only disquieting or rather unsatisfactory part of the brick industry in this district, and particularly in the city, has been the seasonably light demand that has prevailed for vitrified pavers for some time now. This, however, is not in any way due to a lack of interest in this type of pavement here, but is truly the result of a lack of ready funds upon the part of various cities, towns and boroughs adjacent to Philadelphia, as in this city. There is a lot of paving work to be done as soon as the necessary financing routine has been gone through with, and in much of this vitrified paving, brick comes in for proper recognition. As a result of the present situation the consensus of opinion among local paving brick manufacturers is that the outlook for the paving brick industry in and about Philadelphia is particularly good. This expected resumption of activity in the vitrified trade, from present indications, will come with the advent of next spring and continue then for some time, without interruption.

S. H. Yoder, who for many years operated a clay mine and plant at Blandon, Pa., has decided to withdraw from the field and is now arranging his affairs to this end. In pursuance with these intentions, Mr. Yoder has sold his Blandon works to Lawrence Grogan, of Shamrock, Pa., who, as soon as certain improvements planned have been made to the plant, will commence operations where Mr. Yoder left off.

Conditions, although not entirely to the liking of the McAvoy Vitrified Brick Company, of this city, are reported by John C. McAvoy, secretary of the firm, as being satisfactory, in view of general conditions confronting others in the industry. Mr. McAvoy, as others, pronounces the vitrified brick business as seasonably quiet, but finds consolation for this situation through an exceptionally brisk sewer brick demand. The McAvoy Company is now filling several large contracts for sewer material for consumption in sewer building in the northeastern section of Philadelphia, where building work has been carried on extensively during the past several months and is still on the boom.

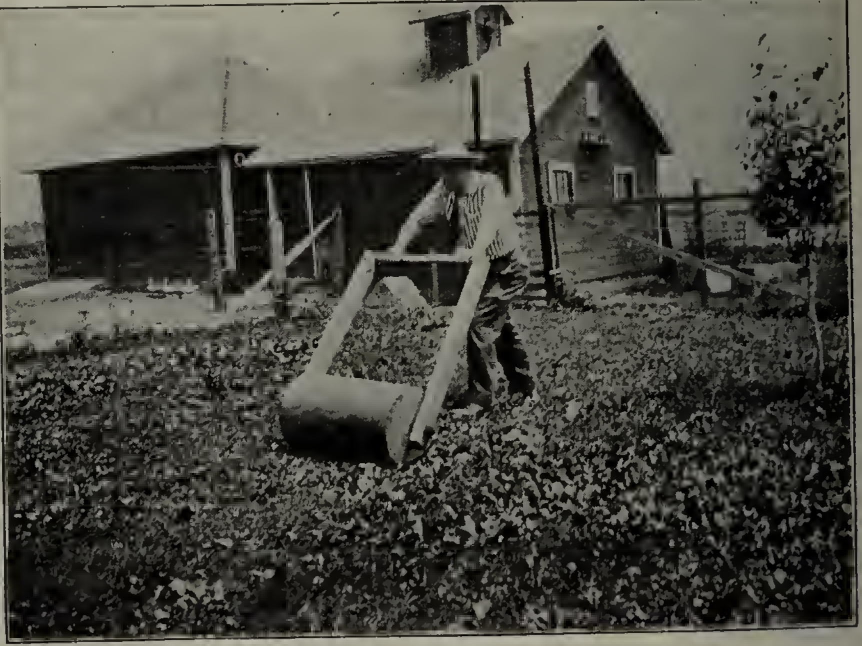
One of the brick dryer houses was destroyed and the plant of the West End Brick Company, at Fifteenth and Allen streets, Allentown, Pa., was threatened by fire on August 30. The fire resulted from the sagging of the roof on a part of the dryer house which first took fire. The flames spread rapidly and had soon consumed the entire frame structure. The exact amount of the damage is not known, as it depends largely upon the number of brick which were destroyed by water and other ways.

Among other of the Philadelphia brick manufacturing enterprises now enjoying an era of increased activity is that of Joseph T. Byrne, at the southwest corner of Twenty-ninth and Clearfield streets. Capacity operations have held sway at the Byrne plant for some time past, and the firm is enjoying a business that promises to make the year 1916 a banner one with them. Modern equipment and automobile delivery trucks greatly facilitate matters with the "House of Byrne" in such brisk times.

An increase of more than $1,000,000 in building work, a large portion of which represents brick buildings, was made here in August over the month of July, according to records obtained from W. W. Gamble, statistician of the Bureau of Building Inspection. Construction work covering 1,247 building operations cost $4,472,120 during the past month, as compared with $3,101,385, the cost of the 1,040 building operations in July. As a means of quickly showing just what conditions have been in the building trades during the past eight months of this year, a comparison of figures for the first eight months of this year with those for this same period of last year cover the ground quickly and accurately. In the first eight months of this year 5,965 permits were issued for 10,863 operations, at a cost of $32,627,125; whereas, in this period of last year, there were 6,623 permits granted for 12,797 operations, costing $26,719,955. A. QUAKER.

A NEW USE FOR DRAIN TILE.

Clay products generally have certain definite uses and in ordinary commercial lines their uses are so generally known that only the decorative materials receive much notice. It is



Drain Tile Used for Lawn Roller.

when clay products are used for something out of line with the purpose of the material that we are surprised and much interested. Such was the case lately with the writer when he discovered a new use for drain tile. It was while visiting a farm owned by a Belgian in northern Indiana that this new use for clay drain tile was noted. The accompanying picture shows graphically the clever idea of the Belgian farmer. The drain tile was filled with concrete, an iron pipe being located in the exact center in which an axle could turn. This made an excellent lawn roller. It struck the writer as of particular interest not only because of the usefulness of the invention in a practical way, but as an object lesson of the superiority of clay products over concrete. It will be noticed in this case he has used the clay drain tile as the wearing surface instead of concrete.

BACK TO TERRE HAUTE.

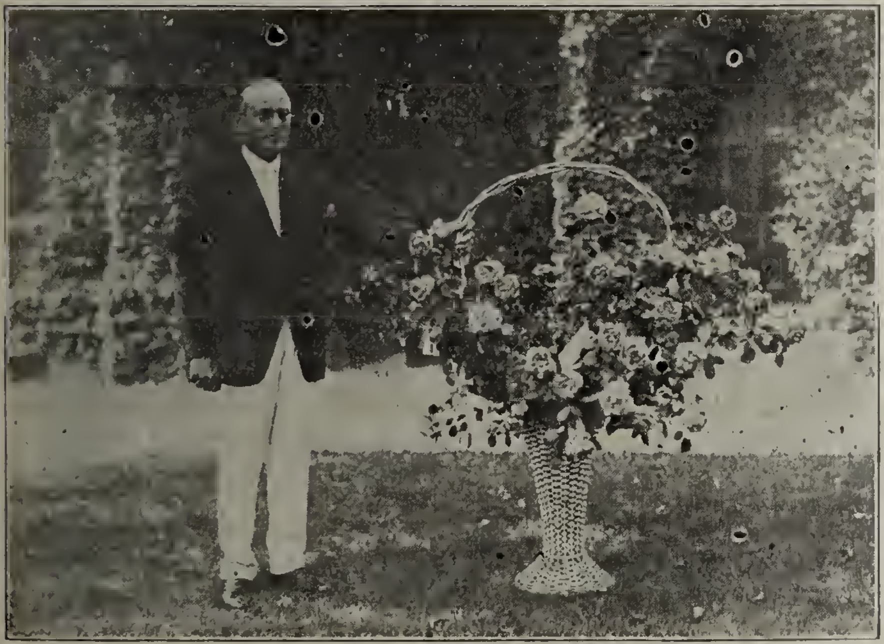
THE MEETING at Terre Haute, scheduled for October 5 and 6, bids fair to be the most largely attended of any of these mid-summer conferences. The monolithic pavement, which will be inspected at Paris, Ill., is a model pavement. It was constructed by Allen Parish, a well-known contractor of that city, who, because of his thoroughness in the details of the work, is in much demand throughout central Illinois. Mr. Parish will be present at the conference and relate in his own way why brick pavements, properly constructed, are the best pavement in the world.

Visitors at the paving brick conference at Terre Haute will, without exception, want to see old Sixth street and Jim Hoskins; not because they are antiques, but because they represent the highest type of excellence. We doubt if any city can match up old South Sixth street for wearing qualities, and we know that Jim is unmatchable.

A VERY PLEASANT SURPRISE.

You had better go this very day
And carry your friend a sweet bouquet,
Than take a bushel of roses, white and red,
To lay on his casket when he is dead.

IT IS VERY PLEASANT to know that one is remembered kindly by friends and neighbors. John Haggerty, one of the leading brickmakers of Detroit, recently celebrated his fiftieth birthday in an unexpected way. Soon after his arrival at his office, a young lady dressed in white came in and presented him with a beautiful American Beauty rose. Five minutes later another lady, similarly attired, did the same, and then another and then another, until fifty roses had been presented to him in a similar way. It then dawned on "John" that his friends had taken note of the flight of years and were taking this means of congratulating him on his anniversary. He accuses Wm. Wreford, secretary of the Detroit Brick Manufacturers and Dealers' Association, of framing up the deal, which was a very pleasant affair. We are pleased to present a picture of Mr. Haggerty and the posies, which, when placed in the basket, made a very beautiful bouquet.



Jno. Haggerty, Detroit, and His Birthday Bouquet.

EXAMINATION FOR LABORATORY SYSTEM IN CERAMICS.

The Civil Service System of the United States government announces that a competitive examination for laboratory assistant in ceramics for men only will be held on October 4, 1916, to fill vacancies in the position in the laboratory of the Bureau of Standards at Pittsburgh, at salaries ranging from $900 to $1,200 a year. The subjects in which the examination will be held are general physics, French or German, practical questions in ceramics, education, training and experience. Applicants must be graduates of or senior students in a course of ceramic engineering or ceramics at a technical school or college of recognized standing. They must be eighteen years old or over at date of examination. Those interested in this matter, who desire to investigate it further and to make application for examination, should write to the United States Civil Service Commission at Washington, D. C., and ask for Form 1312, stating the examination desired.

BUILDING OPERATIONS.

Some evidence that building operations have been recovering from the check that came with the outbreak of the war in Europe is furnished by some figures compiled by the U. S. Geological Survey. In forty-eight selected cities the total cost of building operations for 1915 was $641,769,199, an increase of 4 per cent. over 1914. Twenty-eight of the cities in the list showed increases, while twenty showed decreases.

New York led in the cost of building operations in 1915, with Chicago in second place; whereas, in 1914, Chicago led, with New York in second place. Brooklyn was third on the list, and, generally speaking, we may say that the building operations were more active in eastern and northern cities.

Some credit for this increase in the face of depressing tendencies must be given to the building of factories and warehouses to accommodate war order business of one kind and another. Perhaps had it not been for these the story would have been different, and building operations would have shown a decrease. These helped out, however, and in the meantime there has been a recovering of confidence as well as an enlargement of the prosperity of the country, so that more home building is being planned; and when the figures are in for 1916 we will probably find that home building has constituted a more important factor in this year than for several years back.

To some extent big undertakings—that is, building operations for investment—are held in check a little now by the cost of structural steel and the difficulty of obtaining prompt delivery, a condition which will perhaps be relieved as soon as the tension is over with in the metal markets. Meantime, the prosperity the country over is encouraging home building, so that this year and the next year should see an enormous business in this line. It is up to the brick manufacturer to see that brick has a hearing, and that a fair share of these new homes is constructed of the best building material on earth.

This is one summer and fall in which there has been no complaint of lack of work for men. The great cry has been for more help.

Midsummer Meeting American Ceramic Society.

St. Louis Affords Pleasing Entertainment for Visiting Clayworkers Who Find Both Pleasure and Profit in Plant Inspection.

A COMBINATION of circumstances, not the least of which is the scarcity of labor, which makes it difficult for men to absent themselves from their plants at this season, caused a falling off in the attendance at the midsummer meeting of the American Ceramic Society at St. Louis, August 23, 24 and 25. Nevertheless, the meeting was voted a great success by all the participants, some thirty odd visitors and nearly as many from the local plants. The latter vied with one another in striving to make the occasion one of unmixed pleasure to the visitors. The meeting was a little like the play of "Hamlet," with Hamlet left out, for Secretary Orton was not present, his services at Plattsburg, N. Y., where he took a six weeks' course in military training, preventing his attendance at St. Louis.

HYDRAULIC PRESS BRICK COMPANY
AMERICAN CERAMIC SOCIETY AT ST. LOUIS

Visitors and Hosts at the Hydraulic Press Brick Company's Plant, Wednesday Forenoon, Au

The guests assembled at the Washington Hotel Wednesday morning, where they were welcomed cordially by Professor Wheeler, chairman of the local committee, and his cohorts, who supplied automobiles for conveying the delegates to the various plants included on the program. The "joy rides" were exceedingly pleasant and were prolific of much informal discussion, and the interchange of views and opinions pertaining to the technical phases of the work and the processes in vogue at the different factories. The visitors were mostly ceramic experts who are ever ready for new ideas and thoughts pertaining to their chosen calling, and they found many nuts to crack during their three days' sojourn in the Mound City.

Charles W. Parker as a Glad Hand Expert.

The first plant visited was that of the glass works now operated by the Walsh Fire Clay Products Company, where the visitors were initiated into the mysteries of making glass on a large scale. Those familiar with such plants will readily understand that they had a hot time there. The plant turns out over 50,000 square feet of glass every twenty-four hours. From this plant the party walked to the nearby fire brick plant of the same company, where they were welcomed by Charles W. Parker, the manager, who took special pleasure in explaining every detail and minutae of making high-grade fire brick and block of every sort and character, most of which, because of their irregular shapes or dimensions, are molded by hand. The company has two fire brick plants. The one visited is given over to the exclusive manufacture of high-grade furnace goods, such as tank blocks, refractory blocks and other specials used in glass works; fire bricks and blocks used in blast furnaces; also blocks and tiles for zinc and copper smelters; roasting furnaces, and many other types of furnaces in which high heats are maintained. At this plant is also made the standard 9-inch high-grade Walsh XX fire brick, which goes into every manner of furnaces where high heats are encountered. This particular brick is very popular and is regarded generally as one of the very best made in this country. The plant has twelve kilns, which were inspected in the various stages from filling to emptying, after which the party adjourned for lunch.

Office and Plant of the Hydraulic Press Brick Company.

The visit to the main office of the Hydraulic Press Brick Company was a source of great pleasure. Here the visitors were shown Hy-Tex brick artistically displayed in walls, columns, arches and panels. The display rooms have recently been rearranged and now present the finest array of ornamental and decorative schemes in the building brick business. Face brick of all sorts are shown to the very best advantage. The artistic arrangement challenges the admiration of every visitor and impresses one with the superior character of Hy-Tex brick for decorative work, whether for exterior or interior purposes. From the office the party motored to the No. 3 hydraulic brick plant, where they were welcomed by Superintendent Trowbridge, the man with the megaphone in the accompanying picture, and was shown through the plant which is a combination stiff mud and dry press plant, with a daily capacity of 60,000 face brick.

Next the ceramists were shown through Hydraulic plant No. 11, which is the only paving brick plant in St. Louis. The brick are made from red shale from the company's clay pits at Malcolm, the clay being hauled to the plant in the company's cars over the Missouri Pacific tracks. It is run through dry pans, then into large capacity Chambers Brothers' pug mills. The end cut pavers are made on a Chambers Brothers' brick machine and automatic cutting table. The side cut brick are made on a Bonnot equipment. The brick are dried in tunnel dryers, utilizing the waste heat from the cooling kilns. They have sixteen kilns, each with a capacity of nearly 100,000 brick. A novel feature of the plant is the Barney conveyor, by which the brick are carried from the kilns to the stock piles or cars, which is a great labor saver and therefore is very important at the present time, when there is a scarcity of labor throughout the country.

The visitors were especially interested in the making of enameled brick, and the manner of making the glazes and the process of dipping the brick and conveying them to the dryers and kilns was observed with keen interest. The company makes a variety of high-grade enamel brick in various colors, white being the most in demand. Dinner at a summer garden and a theater party afterwards were a happy finish to a very busy day.

ust 22, the First Day of the 1916 Midsummer Meeting of The American Ceramic Society.

At the Evens & Howard Plant.

A departure was made from the program on the second day, and at 9 a. m. the party motored direct to the plant of the Evens & Howard Company, one of the oldest and largest clayworking establishments in Missouri, where they were welcomed by Vice-President Rhoades and Superintendent Volz. Here the process of making sewer pipe was investigated quite thoroughly. The technical phases of the business were explained by Dwight Farnham, the fourth gentleman from the left in the accompanying group picture, who for several months past has been aiding in the installation of an efficiency system at the plant.

The next plant visited was that of the St. Louis Terra Cotta Company, where Mr. Grady and his associates bade all a cordial welcome and gave them the freedom of the plant, which has many interesting features. The modeling department was the chief attraction; the modeling of ornamental features, large and small, is always interesting, both to the novice and to those familiar with this class of work. The company is now filling an order somewhat out of the ordinary, being the decorative features for a Catholic cathedral, which includes a group of life-size figures of the patron saints of the church. These in their clerical garbs are very picturesque. The finished pieces in the stock room were made in white dull glaze terra cotta, being intended for exterior decoration, for which this ware is peculiarly adapted, being proof against the elements and the gnawing tooth of time. The company's laboratories proved very attractive to the ceramists, and by the time they had finished their investigations, the noon whistle blew, and the visitors were invited to take luncheon in the dining room of the

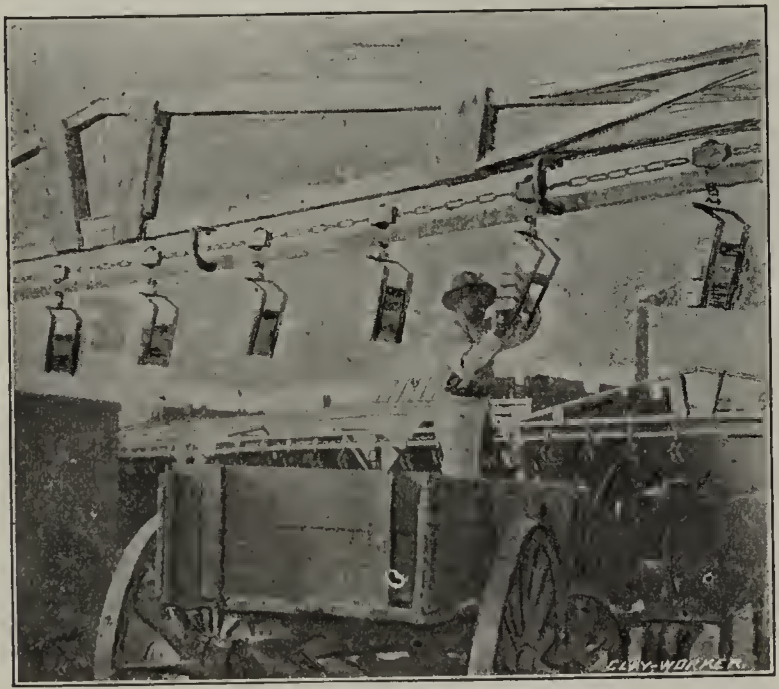
Laclede Christy Clay Products Company

Where luncheon is served every noon for the officers and clerical force from the factory, which is just across the street. It was surmised that an extra spread was made for the benefit of the visitors. At any rate, a seemingly inexhaustible supply of fried chicken and other goodies was served, with a good cigar at the finish, when the redoubtable Fred Talbot and General Manager Richard D. Hatton led the party to the factory office and thence through their immense plant, which covers several acres of ground, and in which is produced all ordinary and several extraordinary refractory products, ranging from sewer pipe in all sizes to hollow building tile. A departure which was a surprise to many of the visitors was the molding of large fire brick by the dry press process. They use several Chisholm, Boyd & White presses for the purpose, and on one of these they were turning out block 12x12x2 inches. A fire at the plant a year or so ago enabled them to rebuild that section, and they have done so on modern lines, making all buildings fireproof and equipping them with every labor saving device, insuring the greatest comfort to the workmen and the highest degree of efficiency in the several departments. When the rounds of the plant had been completed, the kiln stacks were casting long shadows, and as there was not enough time remaining to visit all the plants on the program, the party was divided, some visiting the great plant of the Winkle Terra Cotta Company, others going to the laboratories of the old Christy plant and the third division motoring to the immense sewer pipe plant of the

Blackmer & Post Company.

This plant was so clean and tidy from entrance to exit that one would naturally think they were on dress parade, but it is just one of the characteristics of the plant. They make all sizes of standard sewer pipe, up to that of 42 inches in diameter. The latter is immense and requires great skill in handling, both in the green state and the finished product. They are made on a Taplin-Rice press. In addition to sewer pipe they make drain tile, wall coping, vitrified conduit tile, fire clay, flue lining, chimney pipe and chimney tops.

The Barney Brick Conveyor on Hydraulic Brick Plant.



Loading Brick on Wagon from Barney Conveyor.

The Parker Russell Motor Truck for Carrying Gas Retorts.

The trip of inspection ended at the plant of the Parker-Russell Mining and Manufacturing Company, where the affable Lemon Parker conducted the party through their extensive plant, the chief product of which is gas retorts which they have brought to a high state of efficiency. The company has specialized on the development of proper settings and on the design and construction of gas benches of every description.

Lemon Parker Demonstrates the Efficiency of Motor Trucks.

The company makes fire brick of various grades for blast furnaces, steel works, gas works, lime and cement kilns, bee hive and by-products coke ovens, and, in fact, for all purposes requiring refractories of a high order. They supply fire brick for brick and tile kilns that are especially adapted for that purpose. They operate their own clay mine, thereby insuring control of suitable raw material. Theirs is the largest single factory in the United States turning out high-grade special brick for the above purposes, and their gas retort production alone totals more than half that of all other manufacturers combined. The handling of the gas retorts is a difficult problem, owing to their immense size and weight. An old employe has perfected a truck for the purpose that is remarkable in many respects. It is operated by electricity, storage batteries, and with it these immense retorts, both green and burned, are handled as easily as an ordinary piece of tile. They also operate electrically-driven trucks for the transfer of ware and other materials about the plant. A detailed description of these trucks, with illustrations, was given in the report of the last N. B. M. A. convention in the March issue of The Clay-Worker.

A Pleasing Diversion.

The visitors were unable to inspect the plant of the Highland Fire Clay Company, but were the guests of the genial manager, G. E. Thomas, one of the directors of the Forest Park Highlands, an immense summer resort a short distance from the plant of the Highland Fire Clay Company. One of the chief amusement features of the resort is a fine swimming pool, and while the party arrived after the pool had been closed to the public for the day, through the courtesy of Mr. Thomas, those who desired enjoyed a swim in clear, cool water, which not only removed the stains of travel, but proved a fine appetizer for an excellent dinner served on the balcony of the main pavilion, to the accompaniment of music by a fine band. With its myriad of electric lights, with which the various aerial swings, merry-go-rounds, etc., were decorated, the park was a delightful haven of rest after the hard day's jaunt. A fine vaudeville performance closed the evening's entertainment.

The Trip to Alton.

Friday morning at 9 o'clock, the party boarded one of the fine boats of the Eagle Packet Company and enjoyed a ride up the river to Alton, where they arrived at noon and were met by Eben Rodgers and other good people of that city, who furnished automobiles, in which the party was taken to the paving brick plant of the Alton Brick Company, where they were shown the modus operandi of burning paving brick with producer gas. Mr. L. E. Rodgers, of Zanesville, was prominent among the reception committee, and it is not violating any confidence to state that those who were seeking information in regard to drying brick were afforded full particulars as to the Rodgers dryer, which is one of the features of that fine plant. Most of the party returned to St. Louis by boat in the afternoon. All in all, the meeting was one of the most delightful in the history of these occasions. Those who missed it have good cause for regrets. Prof. H. A.

Wheeler, chairman of the entertainment committee, was congratulated on the success of the meeting and thanked for his untiring services and attentions to the visitors.

List of Out-of-Town Members.

R. D. Ferguson, Treas., Yankee Hill Brick Co., Lincoln, Neb.
Herbert Forester, Principal, Veritas Fire System Co., Cleveland.
G. A. Rankin, PiPttsburg Plate Glass Co., Creighton, Pa.
C. E. Fulton, Pittsburg Plate Glass Co., Creighton, Pa.
I. E. Hardy, Supt., Tiffany Enamel Brick Co., Momence, Ill.
J. W. Hasburg, Pres., J. W. Hasburg Company, Chicago, Ill.
A. P. Hottinger, North Western Terra Cotta Co., Chicago, Ill.
R. K. Hursh, Instr. Ill. State University, Urbana, Ill.
I. J. Kirk, Pres. & G. M., Univ. Sanitary Mfg. Co., New Castle, Pa.
F. A. Kirkpatrick, U. of Ill. Student, Urbana, Ill.
J. F. Krehbiel, Advance Terra Cotta Co., Chicago Heights, Ill.
J. S. McCann, Supt., Streator Clay Co., Streator, Ill.
H. W. Moore, Atlantic Terra Cotta, Tottenville, N. Y.
G. L. Rogers, American Refractories Co., Danville, Ill.
R. A. Steinmeyer, Student U. of Ill., LaSalle, Ill.
F. W. Washburn, Director Ceramic Dept. U. of Ill., Urbana, Ill.
E. G. Zorn, Representative Brick & Clay Record, Chicago.
R. W. Greene, Mansfield, Ky.
A. L. Walden, National Carbon Co., Cleveland, O.
Robt. L. Hare, Fulton Fire Brick Co., Fulton, Mo.
T. A. Randall, Clay-Worker, Indianapolis, Ind.
L. E. Rodgers, L. E. Rodgers Engineering Co., Zanesville, O.
M. F. Beecher, Norton Co., Worcester, Mass.
A. P. Potts, Mason City Clay Co., Mason City, Ia.
F. Brand, Hind Brick and Tile Co., Sandusky, Ky.

THE DRAIN TILE INDUSTRY.

THE DRAIN TILE industry, while it has been of some prominence in the clayworking world of this country for twenty years and has attained some place in thirty-eight states, is nevertheless largely centered in a group of four or five states. The group of states that have led in the drain tile production are Iowa, Indiana, Ohio, Illinois and Michigan. These five states really furnished more than 88 per cent of the total drain tile used in the country or four times as much as was furnished by the other thirty-four states reporting.

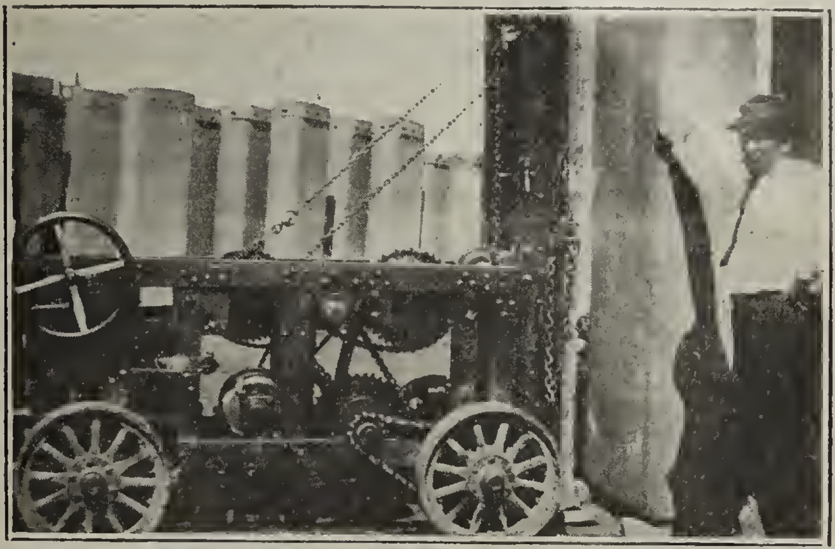
Iowa led the list in drain tile production in 1912 with a total value of $2,293,084. Indiana was second with a total of $1,657,368. Ohio ranked third with a total of $1,546,723, and Illinois fourth with a total of $1,189,910. Michigan, while being the next state in importance, does not show up conspicuously as compared to either of the others, the total production in Michigan still being below the half a million dollar mark. At that, however, it is more than double the production for the next state in line, which is Minnesota.

The total annual production of drain tile in this country has run to pretty even figures for the past four years. For example, in 1911 it was $8,826,314, while in 1914 the total was $8,522,039.

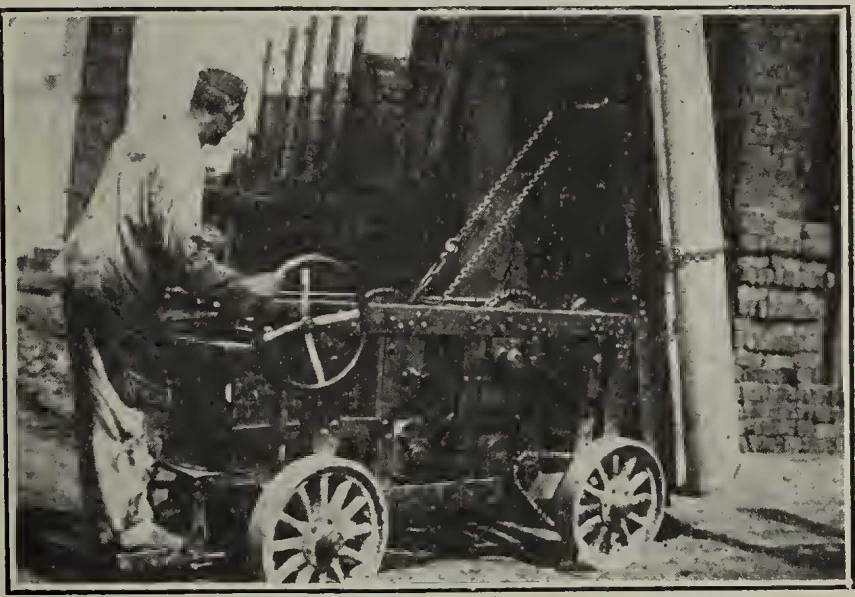
Following the statistical history of the drain tile production from the time it was being set forth as a separate item, we find that twenty years ago, back in '96 and '97, the total production was approximately $2,500,000. This was a sort of low ebb, because back in 1904 it run to about $5,000,000, but these figures are a bit confusing because it is possible some other products were included with it at that time.

Taking a ten-year period, we find that in 1904 and 1905 there was an average annual value of $5,500,000. From there the production kept climbing until it reached the highest point on record in 1910, a total of $10,389,822.

Some day, when the farmers all through the country become duly impressed with the importance of tile drainage and get to using it as they should, the production of drain tile should easily be double what it is at present, and then some. When one considers that more than 88 per cent. of the present important standing of the drain tile industry is a result of the use of drain tile in only four states, then takes into consideration the many other states in which drain tile could be just as profitably used, it becomes impressively evident that there is no line of clayworking which has a better chance or a bigger field for expansion than that of drain tile. Persistent, intelligent exploitation should put this industry on the boom, and if other states can be induced to follow the lead of the four or five which have already realized the importance of drain tile, and have benefited from it, the drain tile industry of the future will be a mighty big thing. There is no better time, either, than right now, while the spirit of boosting is abroad in the land, to get after this drain tile business and make it into the big thing which it deserves to be.



Truck Picking up a Gas Retort.



On the Way with a Gas Retort.

Truck About to Deposit Gas Retort.

QUESTIONS OF INTEREST TO CLAYWORKERS

ANSWERED BY J. J. KOCH.

Acid Rings.

What are acid rings, and what are they used for? What concerns in the country would be in the market for such stock? Will appreciate your very kind attention.

Acid rings are a vitrified clay product—used in towers for making or rather condensing acids—principally hot sulphuric acid. They are also used in the manufacture of other acid substances—and the main requisite is—the rings must be able to withstand the destructive action of acids. The manufacture of same is not a difficult proposition if one has a suitable material, which should burn to a close tight vitrified body, containing the minimum proportion of lime, magnesia and iron, for an open body will resist the destructive action only for a short time. Oftentimes feldspar is added to a close burning body, owing to its cementing power beginning at a lower temperature without breaking down—but feldspar is also added to bodies for inducing vitrification at lower temperatures than such clay would ordinarily require when used by itself. A very good guide for a starting point is the formula for feldspar china, requiring about

China Clay	40-50 per cent
Silica	25-30 per cent
Feldspar	25-30 per cent

If feldspar is not available, substances such as porphyry-feldspathic granite may be utilized, as color of burnt ware has very little significance, the main question being, will the vitrified product resist acid corrosion? Iron is not necessarily a detrimental factor, providing proper vitrification has taken place; for instance, good acid rings are made out of clay of the following composition:

Silica	72.11
Alumina	20.58
Iron	5.48
Lime	0.92
Magnesia	0.54
	99.63

There are so many different kinds of clay used for manufacturing acid rings that the best way is to have your product tried out in an acid factory, for there are quite a number of undecided factors in existence; for instance, as yet it has not been determined whether the highest or best acid proof condition exists, when a body has been burned to the highest temperature, whether the rings are best at minimum, medium or maximum vitrification, whether a body is materially improved by increasing or diminishing its quota of silica or feldspar. Every manufacturer must work out his own salvation. Typical formulae are of very little service. The best way is start in with what you consider a good mix—have your product tried out in an acid factory—then build your product up or down, and when you have found a satisfactory mixture, suitable to your clay, then stick to it and make no more changes or experiments. Some manufacturers salt-glaze their product, some use a comparatively low melting porcelain glaze, corresponding to S. C. 4 or 5 (this would indicate a body temperature of S. C. 8 or 9).

Tests for acid proof conditions are only of use for comparing one product with the other. European testing methods are about as follows: To obtain maximum desirable acid action on the product (large surface action), the clay product is crushed and then passed through a seive of 60 mesh per square centimeter—then such 60-mesh product is again sifted through a 120-mesh-per-square-centimeter screen, and the product remaining on the screen is utilized for making acid-resisting tests. This arbitrary size has no special significance only that of establishing some kind of a standard. This resultant product is washed to remove all dust particles and dried to a uniform weight. One hundred g of such prepared screenings are treated in a platinum dish, with a mixture, all by weight, of

25 parts concentrated sulphuric acid
10 parts nitric acid—spec. gr 1, 4
65 parts water.

The contents of this dish are heated so long, until the water and nitric acid are dissipated and the sulphuric acid begins to fume very strong. After cooling, observing the usual caution, this means is treated with water containing 10 per cent of nitric acid—spec gr. 1, 4—the whole brought to a boil, the resultant liquid decanted and the solid residue washed with water until all traces of acid are removed. After thoroughly drying the loss is found by determining the decrease in weight.

It should be understood that containers influence results, but for obtaining comparative results the process is of great value, as you will obtain data giving you the value of your competitors' products under identical conditions. The limitations are comparatively wide, as acid rings of good value show losses of from 1 to 3 per cent.

PACKING FOR EXPORT.

Packing may appear a secondary matter in shipping goods within the boundaries of the United States, but it is of genuine importance when it concerns shipments to foreign lands.

In the matter of packing the home shipper is inclined to be careless. We will oftentimes use most any kind of box—sometimes a poor new one or, worse, a second-hand one. Sometimes the goods will occupy one-half the space, the other half being filled with anything that happens to be handy—straw, hay, all kinds of old paper, etc. Not infrequently the boxes are shaky and insecure because poorly nailed and not strapped when containing heavy merchandise.

In late years this condition has somewhat improved, but there is still room for considerable improvement. Merchandise shipped to foreign markets must be well packed if you expect the same to reach its destination safely.

Boxes to be carried safely to long distances and most always subjected to rough handling, should be constructed of good lumber. I would recommend spruce or hemlock—not too thick nor too thin. To my mind hard woods, including yellow pine, should be avoided because too heavy and because of their liability to split in nailing.

When contents are heavy boxes should be battened and in all cases lined with waterproof paper and strapped. (Some steamship companies stipulate the latter conditions in their bills of lading.)

Boxes should not be too large nor too small. When too large the consignee will have to pay an unnecessarily large freight bill; and when consigned to countries where the packing is dutiable he will be furthermore called upon to pay duty on the excessive weight of the box.

If the box is too small the packing must of necessity be defective because of the insufficient room for packing material. For packing material excelsior, straw or hay may be used, according to the character of the merchandise. It is extremely important that the packing material be perfectly dry so that the contents may not draw moisture therefrom and probably be damaged or entirely spoiled.

All kinds of material of a high finish should be well wrapped, preferably in waterproof paper. Cutlery and other highly polished metal goods, and all goods subjected to a long water journey or destined to damp climates, must be so wrapped (in waterproof paper) to insure arrival in good condition. I would repeat once more that packing material must be used perfectly dry.

In this specification I do not include the packing of heavy machinery or other kinds of bulky iron or steel merchandise. Shippers of these commodities are, as a rule, experienced packers.—William Tonk in American Industries for July.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

THE PAST MONTH showed somewhat of a let-up in the amount of construction work authorized by Building Inspector W. D. Harper, but this condition is only natural at this season of the year. However, the record of permits issued for the first eight months shows an increase over the corresponding period of 1915 by twenty-three permits and $2,686,795. The totals to September 1 are 2,764 permits, representing investments of $9,482,440. With this amount of construction work authorized this year, one easily can imagine the amount of business which has fallen to the manufacturers and dealers in clay products this season. Although operations authorized decreased in August over the corresponding month last year, there is actually more building going on at the present time than there was a year ago. The figures for August, 1916, are 385 permits, representing expenditures of $705,716.

The use of brick, brick and tile and brick veneer in the construction of smaller buildings, such as residences, duplex flats, etc., has generally increased during the past year. Supply men say that the more sound business conditions during the past twelve months have brought about the consummation of plans for many structures that had been planned previously. This work is of the more permanent nature, using such products as brick and building tile instead of lumber. When conditions were rather uncertain a year ago, people who were planning to invest money in construction held off from building substantial brick buildings whenever possible and waited for things to adjust themselves. For that reason the sale of common and face brick during the season has been remarkable. The use of tile in connection with brick has also increased in fireproof construction. The business in terra cotta, vitrified sewer pipe, vitrified paving block and other clay products has been very satisfactory.

Marshfield's new clay industry, the Marshfield Brick and Tile Company, which was organized as a result of the work undertaken by the Wisconsin Clay Manufacturers' Association in developing the clay products industry, is coming along in fine shape. The brick from the first kiln burned for commercial purposes, containing 140,000 bricks, have been used in the construction of the Sacred Heart church in that city. The second kiln consisted of 150,000 bricks. The product has been pronounced satisfactory in all respects.

The success met with by the incorporators of this new enterprise is very encouraging, and those interested in the project are satisfied that Marshfield has beds of clay that will produce in any quantity the finest kind of building material. The yard is situated two and one-half miles north of the city and connected to the main line of the Northwestern railroad by a spur. The equipment is operated by two electric motors of thirty and seventy-five horsepower. With twenty men at work, the plant has a daily capacity of 40,000 bricks. A large brick building was put up in the spring from the first brick burned, and in it are located the machinery and dry kiln. The dryer has a capacity of 38,400 and the two kilns a capacity of 300,000. The pit is 300 feet from the mill, and the clay is carried that distance by an automatic excavator that works on a cable. The clay bed is covered by only six inches of brack dirt and is from 15 to 25 feet deep. The clay has a blue tinge, which becomes a dark red on burning. As soon as the business warrants, additional machinery will be added and the manufacture of building and drainage tile started.

Articles of incorporation have been filed by the Berthelet Pipe and Supply Company, Milwaukee, Wis., with a capital stock of $30,000. The incorporators are Louis A. Fons, Thomas S. Zulkalski and John Glas.

Dealers in clay products for construction work in this city and state will have additional opportunities to increase their business before the end of the season. There is considerable building which will be announced shortly, although nothing exceptionally big is expected to break. During the month of August there were only three buildings authorized, which will cost $25,000 or more. These will be of brick construction. They are a $25,000 dwelling of Miss Mary Molitor at Marietta avenue and Kenwood boulevard; the lodge hall of the I. O. O. F., on Tenth street, costing $40,000, and a sixteen-apartment building for J. Reeves, on Fourteenth street, costing $36,000. Among the work which will materialize this season is the Stratford Arms Hotel at Grand avenue and Sixteenth street, which will cost $100,000; the factory of the Wisconsin Iron and Wire Works, to cost $22,000; two twenty-seven-apartment buildings for John Hunholz, to be erected on Juneau and Marshall streets, are being planned of solid brick construction, both to be four stories high.

The use of vitrified block for street paving in Wisconsin continues to increase as the year progresses, according to reports from all sections of the state. Much satisfaction is being expressed by dealers in the activities of manufacturers' associations in their efforts to educate the public to the advantages of brick for street pavements. The city of Elkhorn is taking bids this month for the construction of two and one-half miles of pavement, of which a portion will be vitrified block. The amount will depend upon the efforts exerted by brick men when the final selection of material is made after bids are in. There will also be constructed in this connection 6,000 feet of sewers, requiring from 8 to 24-inch vitrified pipe. At Sheboygan, where so much concrete pavement was laid last year, bids have been taken early this month for paving North Fourteenth street, requiring 3,260 square yards of brick pavement; Calumet road, requiring 6,860 square yards for one section and 8,710 square yards for the other. The board of public works at Wausau recently awarded a vitrified paving job on Scott street to Carl Lotz at $2.34 per square yard. Sweeney Brothers, of Reedsburg, have secured a $10,000 contract for the improvement of Water street at Sauk City, Wis., with brick. Mill and First streets at Merrill, Wis., will be paved shortly, bids having been asked on the construction of brick pavement. The common council at Stoughton, Wis., has awarded a contract to Sweeney Brothers, for paving Main street with vitrified paving block, at nearly $14,000. The city of Milwaukee has awarded several lots of contracts for street improvements during the past month, and among these were more than the usual amount of vitrified block jobs.

A. BADGER.

In a row over mismanagement in road building down in Lewis county, Kentucky, the charge is made that two miles of macadam road, which were estimated to cost $7,000, cost approximately $26,000. This would not be so bad if the road had been constructed properly and faced with brick, because then it would have been an investment instead of a waste. Some day the road builders will learn to spend their money wisely and enough of it in the original construction to get good brick roads, and find through this means economy in the end as well as the best roads obtainable.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Cold Chimneys.

Editor The Clay-Worker:

We are having trouble with having one cold chimney in our drain tile kiln. There is a one-foot sag in the roof about four feet square. Do you think this would cause the cold chimneys? Would making the inside chimneys larger help any? We burn with wood. MICHIGAN.

Remedy for Cold Chimneys.

Editor The Clay-Worker:

In answer to your correspondent's inquiry as to the cause why one or more of the chimneys will not draw.

Wood requires very little air, when compared with coal, to give it perfect combustion, and that is all that is necessary to admit, so a very few cubic feet of air is entering the kiln through the fires. An outlet for the escaping production of combustion, together with steam from water-smoking and gases as the kiln gets hot, we call a chimney. The kiln in question has more than one chimney. I have burned kilns with as many as twenty-two chimneys on one kiln. The exact number makes no difference, just so there is more than one. The secret of it is this, the combined capacity of all the chimneys is larger than is necessary to convey off the fumes; the consequence is there is no back pressure. There is plenty of draft, even if two or three of the chimneys do not draw. If a current of hot air is not going up a chimney it is more than likely that cold air is going down it, as the draft will not remain stationary. As each chimney has to furnish draft for a given section of the kiln floor, if any one of them will not draw the tile in that particular section is soft.

The remedy: Be sure the bottom of the chimney is cleaned out, then before starting the fires push all the dampers well in, so that the escaping fumes will have to use all the chimney in their effort to escape. Then as each one commences to draw well, gradually open each damper until it has all the draft needed. It has that when all the fires draw in without smoking out at the furnace.

If one of the chimneys will not draw, close the damper, if necessary, on part or all of the others until it does draw. Leave it in this way until it gets warm, then very gradually open the others. Be sure that there are no cracks in the bottom of the chimney, where air can leak in and kill the draft. I would advise your correspondent if he builds any more kilns, instead of building a kiln with many chimneys, to reverse the thing by building many kilns to one chimney.

ROBERT TWELLS.

Notes from Tidewater, Virginia.

Editor The Clay-Worker:

Suffolk, Va., the Peanut City, took on quite a boom this summer. Among the many fine brick buildings now being erected is the National Bank of Suffolk office building. This building will be seven stories high and basement. The first story, which is now nearly up, is of white marble with white enameled terra cotta trimmings, the other six stories will be faced with pure white porcelain faced brick. When completed the building will cost $100,000. Roswell Edward Mitchell, of Norfolk, Va., is the architect. Fulton Brick Co., Richmond, Va., contractors.

The American Bank of Suffolk is building a new office and bank building. This building will be seven stories and basement. This building is under way now. It will be faced with white rough texture brick from the ground up. John K. Peebles, of Norfolk, Va., is the architect, and Howard & Moss, of Norfolk, are contractors. Will cost about $80,000.

The new M. E. Church has just been completed at a cost of $60,000, Neff & Thompson, of Norfolk, Va., architects. This building is all brick construction and faced with mingled shades of rough-texture brick, manufactured by the Nansemond River Brick & Tile Co., of Suffolk, Va., of which A. V. Sturgeon is general manager.

The Lummis Peanut Co. is building a five-story factory building to cost $50,000. Jesse Johnson, of Norfolk, Va., is the contractor. The reinforced concrete frame is up for this building. It will be faced with a thirteen-inch brick wall. Brick were furnished by the Suffolk Clay Co.

The Nurney building, being erected for Milteer Brothers Co., wholesale grocers, is well under way. Will cost about $8,000; brick construction throughout. A. Stallings & Son, contractors. Sam Stallings, architect.

Plans will be out soon for three fine brick residences to cost about $30,000 each. Scores of residences are under way now, among them a very pretty brick bungalow of R. L. Jacobs. This bungalow is faced with dark grey rough-texture brick and makes a very fine building.

Suffolk is a big lumber manufacturing center, yet they believe in building with brick. Many of the lumber towns in a radius of fifty miles of Suffolk are building fine brick residences. Mr. Gray, of the firm of Gray Brothers, large lumber manufacturers of Waverly, has recently completed a fine brick residence at a cost of $20,000. The brick were shipped fifty miles to a lumber town, to a lumber man, to build this house. The brick were furnished by the Suffolk Clay Co. The building is faced with mingled shades of rough-texture brick. R. L. Turner, of Suffolk, was the contractor.

R. L. Turner, of Suffolk, Va., is just finishing a new bank building at Boykins, Va. E. C. Smith, of Franklin, Va., architect. This is a brick building faced with Bradford red pressed brick.

E. C. Smith, of Franklin, Va., has the contract to build a new brick bank building at Iver, Va.

This ought to be a great boost to BUILD WITH BRICK to see all the lumber towns building with brick, shipping the lumber north and building at home with brick. There are scores of other brick buildings too numerous to mention going up all through this section. H. S. JACOBS.

Manganese Once More Available in Sufficient Quantities to Supply Trade.

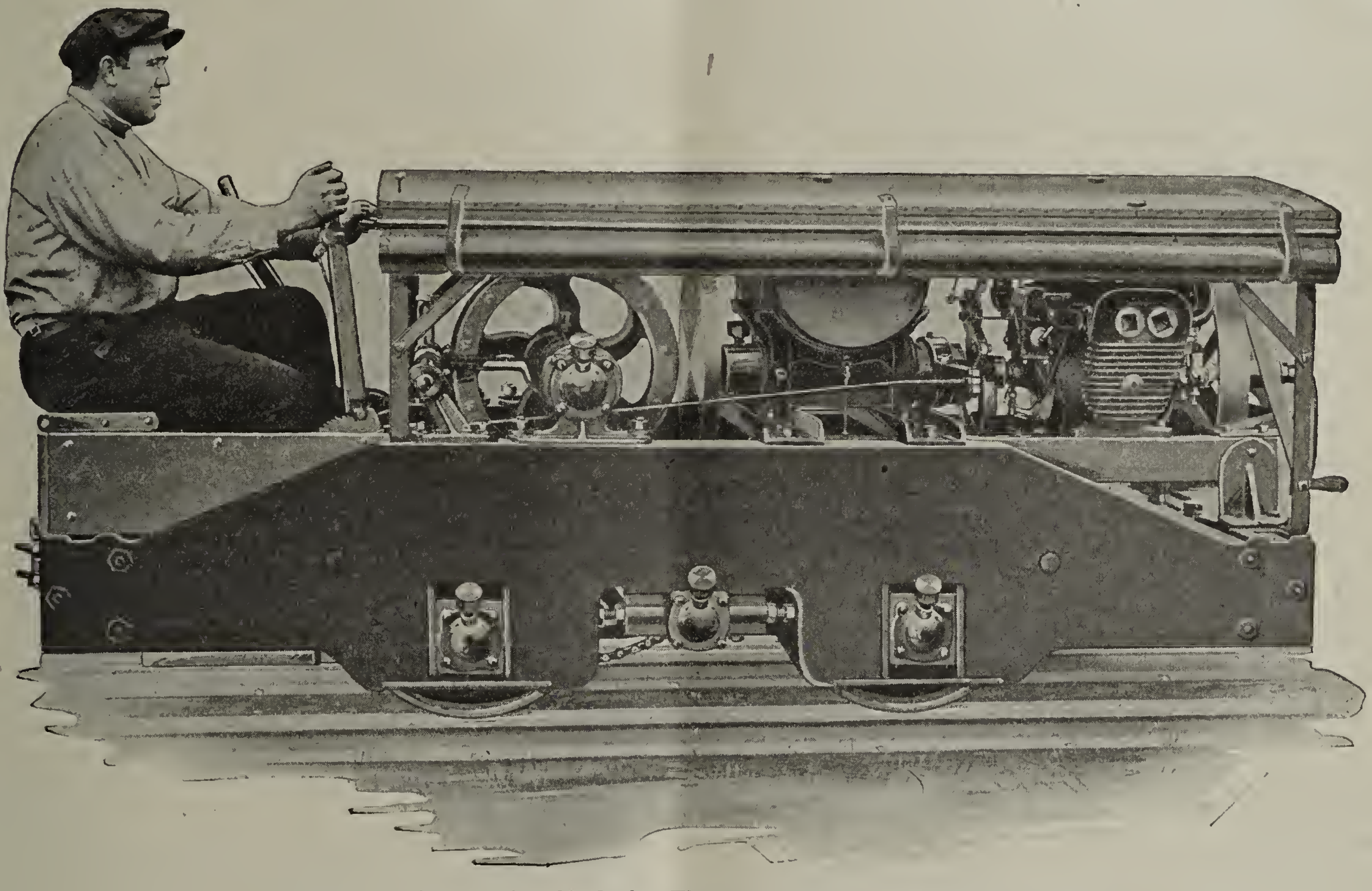
Editor The Clay-Worker:

We are glad to be able to advise you that we are now able to get a fairly large supply of manganese ore and are again in shape to fill orders promptly. Probably few people realized that when the war came on two years ago it stopped the importations of manganese ore, and the small qauntity of high-grade manganese ore produced in this country was snapped up, and the price rose so high that brickmakers could not afford to pay the price asked for manganese with which to make gray brick. Consequently the quantity of gray brick made in this country the past two years has been much below normal. Not only were prices high, but it was almost impossible to secure high-grade manganese ore at all. On our part, we were unable to accept the many orders offered us, but we did so far as it was possible supply our regular trade with what manganese we could get. Manganese matters have now eased up, and we can take care of our trade, as of old. As you know, we have made a specialty of manganese for brickmakers ever since we started in business in 1884, and we have been very successful because we have only none but a high-grade manganese. Yours very truly,

W. R. CUTHBERT,
Treas. National Paint and Manganese Co.
Lynchburg, Va.

CUTTING HAULAGE COSTS IN HALF WITH A PLYMOUTH LOCOMOTIVE.

THE ABOVE is the title of a most interesting catalogue issue by J. D. Fate Co., of Plymouth, Ohio. It contains ninety-six pages of valuable information relative to their gasoline locomotives. The catalogue tells why the Plymouth gasoline locomotive costs less to buy, install and operate than any other system, explains the six points of superiority, describes the four basic principles of construction; namely, the Plymouth friction drive, the Plymouth continental motor, the Plymouth frame construction and the Plymouth-Hyatt roller bearings; gives reasons why their Plymouth friction drive is superior to any other transmission, and proves all statements made from letters from scores of enthusiastic users of these locomotives. There are twenty pages in the catalogue which give details of some of a number of installations made and photographic illustrations, cost data and other information. While a great many Plymouth locomotives are used in clayworking lines, a large number are sold to contracting, construction and other firms outside the clay industry; for instance, such firms as the Winnipeg Aqueduct Construction Company, the Ohio River Contract Company, the United States Drainage and Irrigation Company, Phelan & Sullivan, George A. Fuller Company, Foley Bros., Welch, Stewart & Farquier, the Simons-Sewall & Sons, etc. These firms are strong in their words of recommendation. There are twenty-four pages in the catalogue, devoted to splendid illustrations, statements of facts and excerpts from letters showing the specific records of the use of the Plymouth gasoline locomotive in clay plants and kindred industries. Many pages are used in a similar way with specific records of use in industrial plants, with cost data and installation details. In like manner, the coal, chemical, gypsum, metal and other mining industries are handled. In fact, the catalogue is most interesting from cover to cover, and will be of particular value to all those contemplating purchasing or replacing a haulage system.



Plymouth Locomotive Made by The J. D. Fate Co., Plymouth, Ohio.

NEW LEXINGTON PLANT OF LUDOWICI-CELADON COMPANY TO BE ENLARGED.

"Work on another continuous kiln will be started soon at the plant of the Ludowici-Celadon Roofing and Tile Company at New Lexington, Ohio, which is the largest concern of its kind in the world. The new kiln will be an exact duplicate of the one just completed and which has proven very successful. Its dimensions will be 65x200 feet, and will add about 25 per cent to the capacity of the plant. It will also mean employment for at least seventy-five additional men."

The above clipping from the Zanesville, Ohio "Times-Recorder," refers to the Richardson producer-gas-fired continuous kiln, the same as is being successfully operated by the Hebron Fire & Pressed Brick Co., Hebron, N. D., burning with Dakota lignite, high-grade face brick and hollow building tile from Hebron fire clays.

Anyone who is interested in the latest developments in kiln design can obtain a pamphlet illustrating and describing this kiln by addressing the Ceramic Supply & Construction Co., Columbus, Ohio.

Fortunate.

A New York lawyer tells of a case tried in a fishing town of Massachusetts, during which the chief witness, under cross-examination, refused to state the amount of his gross income.

"You must answer the question," said the Judge when counsel appealed to the court to instruct the witness.

"But, your Honor," said the man, "I have no gross income. I am a fisherman, and it's all net."—Exchange.

BY THE LIGHT OF THE KILN FIRE

The Flight of Time Changes Everything But Brick.

"YOU can't tell what may happen before you're as old as I and had as much time to think matters over and seen the changes that I've seen," said the head burner.

"Why, soon you'll see the autumn leaves falling and the last kiln most finished, the hacking boards piled up and wheelbarrows and scrapers housed for winter and all the boys gettin' ready to go sellin' apple trees or go in the woods for winter. It seems only yesterday since we began striking bricks here. Well, this is my fortieth summer at it. How the time passes. I've burned bricks enough to make a skyscraper that would cover the whole of Boston Common and be more'n a mile high. You will see great changes in this world if you live to burn as many kilns as I have. Yes, life is short, too, but you will see lots of marvelous changes in doing things in future, 'cos folks have got so they want to know the why's of things, and lots of big-minded men that made barrels of money while they were tryin' to benefit humanity have left impressions on society that's goin' to rouse lots of things, and pretty soon, too.

"Now, you see we got the North Pole, telephone, telegraph, wireless, automobile and flying machine since I began, and we got all sorts of improved brick machines, and they're all good and handy, too, but we ain't changed the brick one bit. His disposition is just the same as it was years and years ago; takes mud and sand and water and work to make 'em, and there's going to be more of them made the next ten years than there was the past twenty, and I'm agoin' to tell my reason for saying it. You just go out here on the state road any day in summer time when the rich fellers are running through to Bar Harbor with new-fangled gearing on the rubber tires. If the wind is blowing you can see clouds of dust spreading over the landscape, destroying things so that the farmers are obliged to crop the land that they used to have for hay. The dust is nothing more than the state road pulverized, and they are wearing out faster than the towns can make them, in spite of the fact that the State makes large appropriations and increases its dimensions at every meeting of the Legislature.

"Yes, that's it, and that's just what I am coming to. The road problem cannot be solved in this country without consultin' brick no more than you can run a water mill without water; that's what the clay was put here for. Now, as I said before, folks want to know the whys of things and bimeby, when the roads get so cussed bad that they can't get along successfully and taxes get unbearable, you're going to see some feller get right up in the halls of the Legislature and advocate State roads paved and made of burnt bricks, and burned with the wood cut from the State lands (where millions of cords rot yearly) and transported to the brick kilns on automobiles owned by the State that will run over the brick pavements to the place where they are building new roads. You are going to see these brick yards all over the country wherever there is any good clay bank, and people are going to fuss and try to stop it at first, but they can't do it. It is inevitable. Then you will see good, wide roads, under-drained with tile, fixed so that the frost will be all taken care of and lots of things you know.

Why, just think, young fellow, of the mighty power of men and money it takes to put up the pretense of prohibiting the sale of rum in the State of Maine. Why, if the figures were made public it would cause a rebellion at once. Now some of this tom fooling about law is going to be stopped and people are going to take hold of public things with a different view than they used to, and you are going to see the public schools run on a basis of fair play, too. And after the Medical Association and the American Bar Association get things all fixed up to their liking you are going to find that they hain't got no patent right to attempt to bottle nor to throttle justice, and the people are going to be heard. You will see the judges of the courts elected by the people, and if a man is an honest fellow and enough people knows about it he might become the judge of the supreme court, even if he is a brickmaker. And if the people elect him why then it is up to them to know what his disposition is, for his decision will be the law, and if he don't do it right and according to what the majority likes then his name will be Dennis, and he will be obliged to go back into the mud again. Then you see he will be of service to the country for he can get a job at any time, because there's going to be lots of bricks made, and good brickmakers that want work will be in demand.

"Just think of it, if the people had their way of it now there's lots of these judges that's backed up by the whisky trust to help fool the people and force them to drink stuff that never saw a distillery, and has a stamp on it saying (seven years old), just to make it look good, that would have to take a shovel and go tending tread or go work in the clay bank counting bricks or get a dispensation so that they could learn the law of gravitation sufficient to run one of the government's automobiles to haul bricks to the crossroads or wood from the forests. Yes, you're going to see government distilleries and government breweries, and there's going to be a regulation about it that the whole people is going to know about. You will find that a fellow that don't want to do his duty as a judge will have to take his good clothes off and go into the mud and redeem himself like any other laborer, and when a man gets so darn foolish by drink that he don't know how to treat people decent, instead of giving him thirty days in jail at the expense of the State or county, supporting him as a loafer, he will have to take his good clothes off too and go in the mud with the other boys and take his medicine, and work like hell to help build these brick roads. It will do him good and will help the world.

"I tell you, young fellow, you don't want to think that the people ain't learning a thing or two once in a while between the lines, 'spite of all this bunco business about education. There ain't going to be any need of preserving ancient languages to have handed in small select parcels to those who have money enough to get to college and play football at the expense of the laboring public. Folks are going to have other folks talk English, and if you got the belly-ache and go to a doctor, when he gives you one of them papers on which he has scrawled his hierogliphics for you to hand to another wise guy, you are going to begin to learn to throw the stuff away and get a liberal education at home from your mother or aunt, who will give you a dose of common salts, and when you walk down street the people will look you over and say what a wonderful cure Dr. Galic made. I tell you the times are going to change many things. You can see it as plain as the clouds in the sky. Think of milk eight cents a quart, and eighteen-year-old boy graduating from the high schools by thousands, and after fussing away their parents' time and money find themselves obliged to work as clerks for men who never knew a thing about school education till they earned the money themselves. Yes, you are living in the very best of the world's time of progress. So many men have made such an amount of wealth that now it is not money altogether that inspires them, but a desire to accomplish something that will connect their memory with some enterprise that will endure to the comfort of future generations, and you will see that the span of human life will be lengthened, and with national automobile tracks paved from ocean to ocean there will be less accidents and folks will learn to respect others' rights, and the ones that do not will suffer. My, oh my, how the time flies! Come, boys, fill up again! Charlie, get some soft mud and daub the crack at the north corner, and, Joe, throw a small stick on the bare spots as you fill.

A. BURNER.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE PAST MONTH has been exceptionally active in the California building trades. In spite of the greatly increased cost of steel and other materials, there has been no let-up on building projects of importance, apparently. The setbacks due to the longshoremen's strike have largely been made up for now, and in San Francisco there are at least a dozen large business blocks going up in the downtown district. Moreover, besides the new buildings, some of which are the largest ever built in the city, several old office buildings are being reconstructed or new stories added. Brick and terra cotta products are being used in greater proportion than was the case a few years ago, and this fact is not due entirely to the increased cost of steel for reinforcing concrete work, but chiefly to the successful results produced in brick and terra cotta construction. The clay products people here are not doing any special publicity work at present, yet builders are favoring clay products more and more, especially in all high-class buildings. The class of buildings being erected is a credit to any modern city, both for looks and utility. There is an absence of garish ornament, and a pronounced preferment for good, solid, dignified structures. Terra cotta trimmings, and in some cases polychrome terra cotta, are used with best effects. Terra cotta wall tile and flue linings, etc., are, of course, of proven merit and are very generally used. Interlocking tile for low structures is more popular than ever, and roofing tile is used largely on school, library, business and private buildings constructed of interlocking tile. Face brick and terra cotta products for residences are in active demand, and the present market for common brick is about as favorable in prices and volume as it has been for a long time.

Paving brick work is still going ahead on a large scale, despite the advanced season. Country roads paved with brick seem to have given satisfaction, and no doubt there will be a considerable amount of new road work of this class next year. In San Francisco brick paving is being used on many streets, and the idea is steadily growing. Paving brick, manufactured locally, is now given the preference, and besides being cheaper than brick from other states, is said to be very satisfactory. Brick manufacturers in California have been experimenting for a long time with paving brick, and now they seem to have evolved a durable product.

Gladding, McBean & Co. are having considerable new work of importance. One of their largest new contracts is for the terra cotta construction tile and face brick for the John Breuner furniture store of Oakland.

W. S. Hoyt, manager of the United Materials Company, has returned from a trip to Los Angeles. He says the business of the Los Angeles Pressed Brick Company is thriving and that the new unit being erected at Elsinore, Cal., will be ready for operation this fall. The United Materials Company has enjoyed a fine local business this summer, though somewhat handicapped by shipping difficulties. The company is furnishing common and pressed brick for the Porter school at Alameda, Cal.

The Garden City Pottery Company, of San Jose is to entertain as their guests during the annual field day of the Pacific Coast Horticultural Society, the members of that body on September 10. The delegates will be shown through the pottery plant, and every operation will be explained. The company has planned to serve refreshments and in other ways provide for the comforts of the guests.

An award of contract has been made by the San Francisco board of public works to the California Brick Company for paving brick, which will be furnished at $33 a thousand. This is $10.50 less per thousand than the city paid under contract with outside concerns.

The Pratt Building Material Company has been awarded the contract for interlocking tile for the Dow library of the University of California, at Berkeley. Mr. Pratt is still delivering materials on the J. K. Armsby building in San Francisco and on several other important jobs. Mr. Pratt states this summer's business on Hercules interlocking tile has been uniformly good.

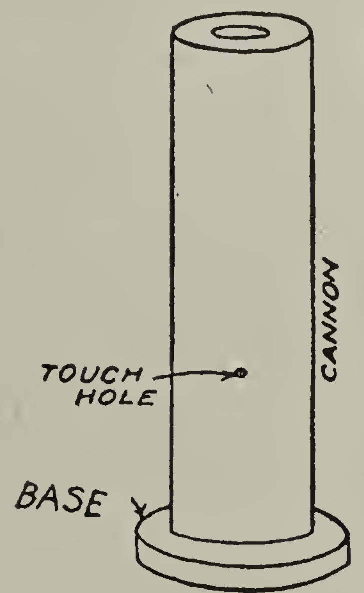
San Francisco, September 5, 1916. SUNSET.

A NEW GUN THAT SHOOTS SOOT FROM STACKS.

Many industrial plants are frequently put to great trouble and expense through their smoke and kiln stacks becoming clogged with soot, so that it is impossible to maintain sufficient draft.

A simple, economical and most efficient method of clearing the stacks of soot has lately been discovered. It consists in loading what is known as a "stack gun" with blasting powder and shooting it up the stack.

The gun can be made out of an old piece of shafting about 4 inches in diameter and 14 to 16 inches long. Bore a hole 1¾ inches in diameter and 10 inches long in the center of the piece. Then bore a small horizontal hole one-fourth inch in diameter through the piece to the bottom of the center-bore. This hole serves as a touch-hole for inserting the fuse.



The whole thing can be mounted on a pedestal about six inches in diameter, so that it will stand in an upright position.

The method of operation is as follows: Pour some blasting powder into the mouth of the cannon to about two inches from the top. Tamp to the collar with dry clay. A short piece of fuse is inserted in the touch-hole and in contact with the main powder charge. Open the flue door at the bottom of the stack, set the cannon on the bottom and, in the center of the stack, light the fuse and close the flue door.

The explosion shakes and loosens the soot adhering to the sides, causing it to fall to the bottom.

A charge of eight inches of powder one and three-fourths inches in diameter is sufficient for a stack up to 100 feet high and four feet in diameter or over. The number of shots necessary to clean a stack thoroughly depends upon its condition. Ordinarily, three or four shots will clean a stack, but if very dirty it may require more. The size of the charge and length of the cannon can be regulated to suit the height and diameter of the stack.

There is said to be no doubt about the efficiency of this gun for cleaning smokestacks. One of the largest manufacturing concerns in the country has used this method for several years, without an accident or injury in any way to the stacks.

BUILD WITH BRICK.

This Slogan to be Carried to the Metropolis—The Second Complete Home Show to be Held in The Grand Central Palace, New York City, March 5 to 11, 1917.

THE SUCCESS of the first American Complete Home Show, held in Cleveland, last March, was so pronounced, the benefits derived were so great and the enthusiasm of the exhibitors so unbounded that the promoters have decided to repeat the Home Show in the chief city of the Nation, and to there demonstrate again to home builders the advantages in safety, in economy, in health and comfort, of the unburnable time-defying brick home.

Safety first is really more important in home building than in any other enterprise. Surely the family should be housed with equal or greater care and protection from fire than one's goods and chattels. The home, above everything else, should be safe and sanitary and a complete Home Show will demonstrate to the home builders of the East, that brick homes meet the requirements far better and with really greater economy than any other material.

Speaking of economy, it should be borne in mind that in home building, it is not the first cost that counts, but the upkeep, and the brick home is lower in cost of up-keep than the home built of cheaper materials to begin with. The trite saying, "The best is the cheapest," certainly applies to a brick home. These are facts that will be made clear to prospective builders at the second American Complete Building Show, which will be under the direction of those who so successfully conducted the first one. It will be bigger and better and more diversified and comprehensive than was the Cleveland show, and many manufacturers who were skeptical and hesitant then are enthusiastic now and, it is predicted, will make far more elaborate and attractive displays in the Grand Central Palace than they did in Cleveland.

The purpose of the Complete Building Exposition is to convince prospective builders that brick is in every way the most desirable building material, not only as a matter of economy, but as a matter of beauty in architecture. It has been well said that a good brick house never grows out of fashion, as do the cheap, temporary houses. The brick house fits into its surroundings and becomes a part of it, everlastingly, tomorrow and forever. Vines may be trained over its walls, never to be torn down, for there is no repainting or repairs to a brick home. Instead, they grow more beautiful with the passing years. A brick home enables the owner to realize upon the increased value of his land and this increase is not offset by the depreciation of the house itself. For these reasons the brick house is a good investment for the owner and in addition to providing a safe and comfortable home, summer and winter, it is his best savings bank.

The co-operation of the brickmakers of the country is particularly desired by the promoters of the show and they are urging earnestly that the annual convention of the National Brick Manufacturers' Association be held in New York City at the same time, and while the matter has not been definitely determined as yet, there is a fair prospect that arrangements will be made to hold the thirty-first annual convention there at that time. If that is done, it will be the first meeting of the N. B. M. A. in the great city and it is predicted that on that account the attendance will be larger than ever before.

Those desiring information in regard to space for exhibits at the Home Show are requested to communicate with Ralph P. Stoddard, secretary, Cuyahoga Building, Cleveland, Ohio.

BROWN INSTRUMENT COMPANY AT DETROIT.

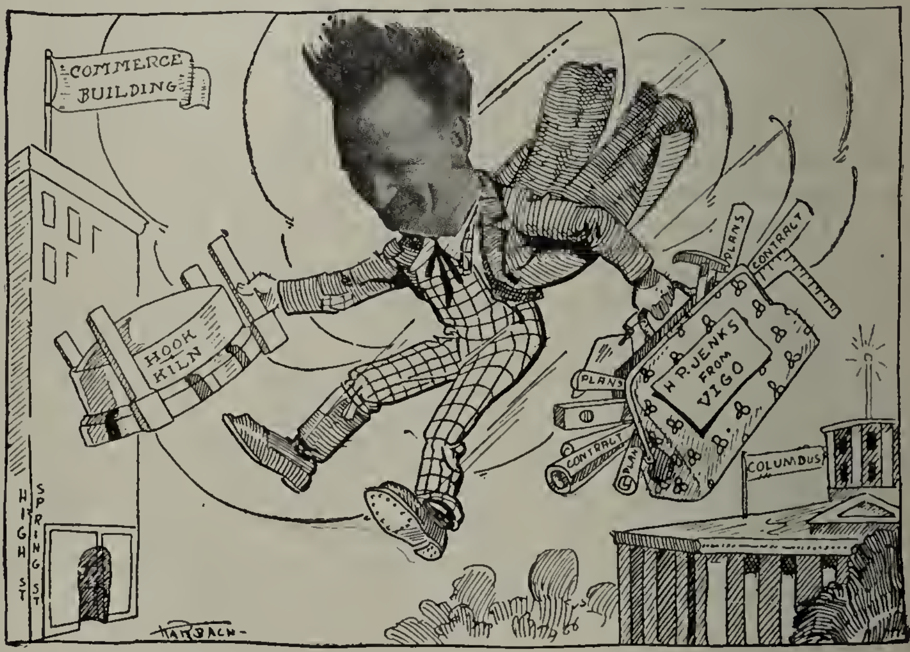
A branch office has been established at Detroit, Mich., by the Brown Instrument Company, which will be in charge of Mr. William Printz, formerly assistant sales manager at Philadelphia. Clayworkers desiring information in regard to pyrometers and other similar appliances, may obtain same by calling on Mr. Printz, 612 and 613 Chamber of Commerce Building, where a full line of pyrometers, electrical recorders, etc. (see ad on page 289), will be found subject to inspection.

CHANGES IN THE CERAMIC DEPARTMENT, UNIVERSITY OF ILLINOIS.

Students in clayworking who gather at Urbana for the coming term of the Ceramic Department of the Illinois University will find a new corps of instructors, with improved facilities offered in the new building erected especially for this department. Dr. Edward W. Washburn, professor of ceramic chemistry, will be in charge of the department, and will have for his assistants, Prof. Cullen W. Parmelee, formerly in charge of the clay school at Rutgers College, New Jersey; Howard Clinton Arnold, until recently secretary of the Ceramic Supply & Construction Co., Columbus, Ohio, and Ralph K. Hursh, who has been connected with the Ceramic Department in former years. It is anticipated that the department will have a record-breaking enrollment. Those desiring application blanks, etc., will please apply to Ceramic Department, Illinois University, Urbana, Ill.

H. P. JENKS ANSWERING A HURRY CALL.

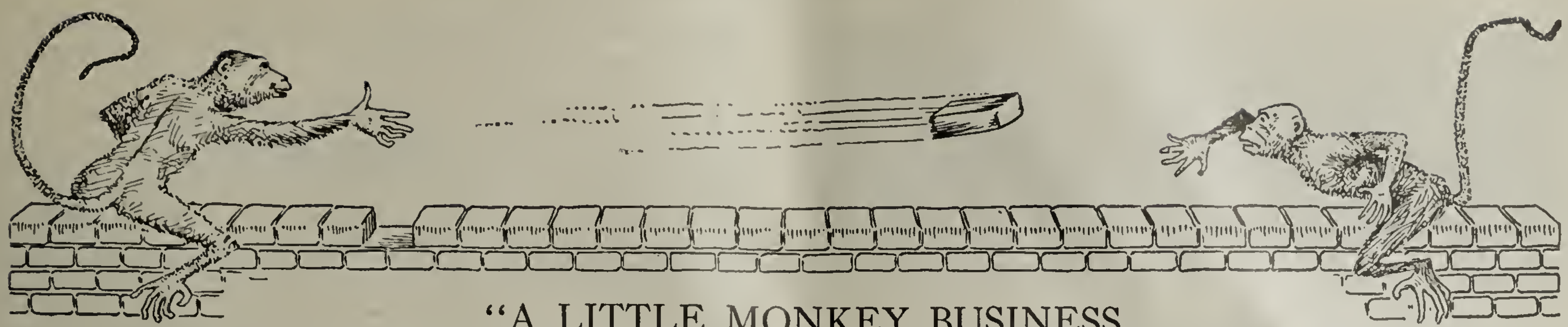
At first glance, the reader might think from this illustration that the manager of the Hook Patent Kiln Company is up in the air, but such is not the case, instead, it shows H. P. Jenks answering a "hurry call" for plans and specifications for a Hook kiln. As the reader will find by turning to their ad on page 279 of this issue, they not only offer the Hook kiln, but a high-grade line of kiln bands, grate bars and kiln accessories of all kinds, which are so much in demand that they have established headquarters at Columbus, Ohio, where, in room 614 Commerce Building, they will be more than pleased to extend the glad hand to any clayworker who may happen that way.



THE ADVANTAGES OF A BRICK HOUSE.

S ecurity from fire.
A lmost as cheap as frame.
F ire insurance rates very low.
E xterior never needs painting.

"BUILD WITH BRICK."



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

PIGS IS PIGS.

The farmer that has a pig or two in the back yard is liable to have an easy chair or two on the front porch.—Southwestern Journal of Commerce.

* * *

Not So Reckless.

"As I understand it, you lecture on the subject of peace at any price."

"No. My rates are $200 per lecture."

* * *

FEAT.

Some free advice I'll now give you;
Just think it o'er and take your time;
You must accomplish some feat to
Leave footprints in the sands of time.
—Ex.

* * *

Willing to Learn.

"Well, Dinah, how are you and your new husband getting along?"

"Firs' rate, Miss Betty. I been 'greeably 'sprized in dat man."

"Does he treat you all right?"

"Yessum. He sho do, and I ain't had ter hit 'im but one time. I never seed er nigger learn as quick as he do."

* * *

Faultless Logic.

"Ma," remonstrated Bobby, "when I was at grandma's she let me have fruit-tart twice."

"Well, she ought not to have done so, Bobby," said his mother. "I think once is quite enough for little boys. The older you grow, Bobby, the more wisdom you will gain."

Bobby was silent, but only for a moment.

"Well, ma," he said, "grandma is a good deal older than you are."

* * *

Not Merely Their Attire.

A Cleveland party went out automobiling the other night and had an unpleasant mishap. It occurred on the Euclid road not far from Willoughby. A four-footed creature of intensified odor got in the way of the car. Nobody in the auto noticed the impact, but everybody noticed the appalling result.

The man who drove the car told a friend about it the next day.

"Terrible," the friend agreed. "I suppose you all had to change your clothes?"

"Change our clothes!" snorted the chief victim. "Why, we even had to change our tires."—Cleveland Plain Dealer.

THE ADVANTAGES (?) OF A FRAME HOUSE.

F ire insurance rates much higher.
I ncrease in cost of heating.
R epair bills always piling up.
E xterior painting every two years.

"BUILD WITH BRICK."

"Well, if I were you I would not have 'George, to his dearest Alice' engraved on the ring. If Alice changes her mind you can't use the ring again."

"What would you suggest?"

"I would suggest the words, 'George, to his first and only love.' You see, with that inscription you can use the ring half a dozen times. I have had experience in such matters myself."—Tid-Bits.

* * *

For Others.

Irate Father—It's astonishing, Richard, how much money you need.

Son—I don't need it, father; it's the hotel-keepers, the tailors and the taxicab men.—Boston Transcript.

* * *

Disproved.

Artist's Wife (during quarrel)—You were quite obscure before I married you.

Artist—You didn't have any trouble in finding me.—Boston Transcript.

* * *

Excused.

"Didn't I hear you swear while in the dentist's chair?"

"Yes, you did. The dentist put a dam in my mouth."

* * *

Try This.

Broke—Are you superstitious?

Bloke—No, not a bit.

Broke—Well, then lend me $13.

* * *

Deadlier Than Usual.

"I understand that all the warring nations find that women are perfectly able to make shrapnel."

"I'll wager they make it in their own way, however. One cupful of gunpowder, one cupful of nitroglycerine, a pinch of fulminate, and so on."

* * *

Inefficient Service.

Tailor—The postal service is in a wretched condition.

Friend—Never noticed it.

Tailor—Well, I have. During last month I posted one hundred and eighty statements of accounts, with requests for immediate payment, and, so far as I can learn, not more than two of my customers received their letters.—Dallas News.

* * *

More Difficult.

Since swords as plowshares are displayed,
A mightier task itself presents.
Can guns and submarines be made
To serve as farming implements?
—Washington Star.

* * *

Hard To Damage.

"Alpine scenery is very grand."

"Very durable, too. I imagine it will pull through the war all right."—Kansas City Journal.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVI. SEPTEMBER, 1916. No. 3.

CURRENT COMMENT.

The wet pan is one type of mud slinger that is useful.

* * *

There is not enough burned clay roofing tile being made or sold.

* * *

Not much is said about it, but sewer pipe seems to be an important item and getting more important right along.

* * *

The size of a man's business may be some gauge to his business capacity, but the real test is the profits he gets out of it.

* * *

Fish yarns and vacation stories, be they ever so wild, are at least safer and saner than political arguments, and they cause less hard feelings.

* * *

A 30 per cent. increase in the value of common brick would raise the average price to $8, and that is really a modest price for the best building material on earth.

* * *

The average brick man can be good enough friends with another brickmaker in some distant part of the country, but in being friendly with his next door neighbor is where the rub comes.

* * *

A little pushing of flooring tile for porch use will round out nicely the present tendency to build brick piers and parapet walls, and it will add much to the consumption of clay products as well as furnish a better porch floor than one faced with concrete.

* * *

With the abundance of money in this country that we are reported to have, there should be no complaint of slow collections. There are some complaints, however, which remind us that we should institute a reform and adopt the slogan, "Pay and be paid."

* * *

If you are jealous of what some other fellow is doing, the best answer is to get busy and do something better.

* * *

The gravity carrier idea is one that is found useful in many ways, and this gravity carrier is now a familiar object nearly everywhere one goes.

* * *

The common brick, third of the brick and tile production, is the backbone of the industry, and the backbone needs a little strengthening and building up.

* * *

If we could just get as much action into a campaign for boosting brick as is gotten into our political campaigns, there would be big doings in the brick world in the next few years.

* * *

Drain tile showed some increase last year, and from the general realization among farmers of the benefit from drainage there should be considerable further advance in the use of this product.

* * *

In addition to the regular front or face brick we are now producing annually approximately a million dollars worth of enameled and fancy brick, a fair share of which is used for interior work. This is a good line of clay products that may be further advanced by exploitation.

* * *

The finding in the editorial rounds of the month of a fire brick plant which readily consumes all of its kiln culls for regrinding and mixing with raw clay has set us to wondering a little as to what benefits might accrue in making other brick and clay products by grinding up and remixing all the kiln culls. Wherever it can be shown to prove advantageous it should be the ideal way in which to utilize this form of kiln waste.

* * *

September is a big month for agricultural fairs, and because of the persistent advocacy of taking advantage of such occasions to display and exploit brick we naturally do a little wondering every time this month rolls around about how many have taken advantage of these occasions to boost their game. We hope those who have done effective work at the fairs during the month will take time to tell us about it.

PREPARING FOR THE RAINY DAY.

One of the good things that will come out of all this agitation about preparedness and the discussions of the question of what will happen when the war stops will be a thorough injecting into the business sentiment of the country the idea of preparing for a rainy day.

Incidentally it may be remarked that this is one of the ideas which the Federal Trade Commission has been hammering on right along in its efforts to assist business throughout the country. The argument is advanced that a man should get enough profit out of his business as he goes along to lay aside a per cent. against times of depression. We know these times come occasionally, like the rainy days, and it is those who do not anticipate them and prepare accordingly who feel the effects more and suffer greater distress.

So entirely aside from what we may need and what we may do in the way of special preparedness in the industrial world for the end of the war, the business of the country will surely benefit from getting this idea into its system. It is a truism of life that we should always lay by something for a rainy day. This truism applies to business as well as to individuals, and we seem to be ripe for the beginning of a general application of it. This is good, and we hope the idea of being prepared for a rainy day will stay with us permanently.

ENGLAND'S BAN ON BUILDING.

In some parts of our own country the war has had some depressing effect on building operations other than those involved in erecting new factories and warehouses, but these conditions here are due to hesitancy about building, while over in England there is an actual ban on building operations that makes it hard for the makers of building brick and other building material. A part of the propaganda to confine the expenditure of effort and money to things absolutely necessary puts restrictions on building operations, so that a man virtually has to get special permission before he can build a house or anything else. It is figured, too, that building operations will not be resumed with activity in England itself immediately after the close of the war, but that the materials will all be required in rebuilding the countries that have been devastated. This should really mean an era of prosperity in building material extending over several years after the war ends; but for the time being the government over there has added to the natural depression in the building trade by putting a restriction on this work, so that metal and other material may be available for war needs.

CLAY MINING IN 1915.

As has been mentioned in The Clay-Worker from time to time, the war in Europe has served to stimulate research and development in the mining and marketing of our native clays. As a result of this the U. S. Geological Survey reports that clay mining in 1915 was more prosperous, especially during the latter part of the year, than in 1914.

The total quantity of clay marketed in 1915 was 2,362,954 short tons, valued at $3,971,941. This gives some idea of the magnitude of our clay mining and marketing business, entirely aside from the clayworking and burning industry, as this represents clays that were marketed and mined apart from and sold to clayworking industries and other users of clay. We have hopes, too, that this is but the beginning of a new day, in which we will see developed an extensive business in the mining and marketing of clay.

Fire clay is the most important of our clays, so far as independent mining and marketing are concerned, making up nearly half of the total in quantity and about two-thirds of the total in value. The fire clay mined in 1915 amounted to 1,570,481 tons, valued at $2,361,482.

There was mined and marketed domestic kaolin, the purest form of clay, to a total of 28,031 tons in 1915, with a value of $241,520.

OUR MANUFACTURING INDUSTRIES.

The progress in this country during a five-year period is set forth in a preliminary bulletin of the coming census report of 1914. This report will make comparison as between 1909 and 1914, and the preliminary bulletin indicates something of the progress that has been made.

The first noticeable feature is that factories have increased in size rather than numbers, the total increase in numbers for the five years being less than 3 per cent., whereas the total increase in capital employed is 23.7 per cent. The total capital employed in manufacturing during 1914 was $22,790,880,000, and the average per establishment was $83,000 as compared to an average of $69,000 in 1909. This illustrates graphically the growth of bigger establishments. It should be borne in mind, however, that the census figures do not take into consideration portable mills and community enterprises, in which we find quite a lot of manufacturing.

The manufacturing institutions paid out for salaries in 1914, $1,287,917,000 and for wages $4,079,332,000, an increase in salaries of over 37 per cent; in wages, of 19 per cent. The raw material used is valued at $14,368,089,000, an increase of 18.3 per cent., and the total value of the manufactured products, $24,206,323,000, an increase of 17.3 per cent.

The statistics show that the greatest number of wage earners were employed during the month of March, the total number for this month being 7,242,752, while the minimum number was employed during December, making a total of 6,640,284 for that month.

The most impressive thing about this report is in the fact that the average capital per institution is $83,000. This would indicate the passing of small establishments and point to an era of what we might term big business; and the fact of the figures makes it look discouraging for the man who would undertake manufacturing in a small way with limited capital. Still we are being told by men who are in a position to know that there never was a time when opportunities were better for the small business man.

EXPORTS OF CLAY PRODUCTS.

While the clayworking industry is one that depends mainly upon the domestic trade, and, in fact, relies more upon domestic consumption than any other industry of equal magnitude, still we are developing some export trade, and we have reached the point in this development where the export business constitutes an interesting item in the clayworking industry. For the fiscal year, ending with last June, our total exports in burned clay products amounted to $3,607,824. This is the trade to foreign countries proper, and in addition to that we had some trade with our own non-contiguous territory. For example, we sent earthen, stone and chinaware to Alaska, to the total value of $84,566; to Hawaii we shipped $61,421 worth of earthen and china ware; to Porto Rico we sent $46,068 worth of brick and tile, earthen and chinaware, to the total of $71,656, and to the Philippines we sent a total of burned clay products of $17,040. These shipments to our non-contiguous territory are in addition to and apart from the export trade proper, which is as follows:

Brick—	
Building	$ 262,058
Fire	1,600,568
Chinaware	228,791
Earthen and stoneware	427,019
Sanitary earthenware—closets, bowls, sinks, lavatories, etc.	204,269
Tiles (except drain)	296,215
All other	588,904
Total	$3,607,824

A BILLION BRICK.

Every time the statistical facts of the clayworking industry are tabulated we are reminded of the great magnitude of common brick consumption in greater New York, which is the biggest market in the country for brick.

The returns for 1915 show the consumption of approximately a billion brick in greater New York, the exact figures as to output in the famous Hudson river district being 960,527,000 brick. What is known as the Hudson river region extends on both sides of the Hudson river from New York to Cohoes, including Bergen county, New Jersey, and within the last year the Raritan river district in Middlesex county, New Jersey.

The brick production for 1915 in this region showed an increase over 1914 of 72,261,000 brick and also of 31 cents per thousand in value.

The New York portion of the region under review marketed 741,568,000 common brick in 1915, valued at $3,744,548, or $5.50 per thousand. This, as will be seen, was about three-fourths of the total quantity and was an increase for this particular region as compared to 1914, both in quantity and value.

The county of Ulster alone, which was the leader in production, produced nearly a quarter of a billion common brick, valued at over a million dollars, or nearly a third of the total output in value of that district. Dutchess county was second and Rockland county third. New Jersey's portion of the production was 218,959,000 brick, valued at $1,264,517, an increase in both quantity and price as compared to 1914.

HY-TEX ART.

The Hydraulic Press Brick Company has sent out from time to time from its St. Louis Office the finest printed matter ever produced in the exploitation of brick for building operations, and their latest offering in the booklet line is in keeping with their former artistic efforts. They title it "Hy-Tex Brick," and it is a work of art all the way through, showing sketches of brick homes, done in colors, and it is full of good advice and stubborn facts about the benefits of building with brick and the small additional cost which makes brick the cheapest in the end as well as the best always.

WESTERN ROOFING TILE.

A splendid example of western enterprise is furnished by the Los Angeles Press Brick Company in a roofing tile catalog, of which we have received a copy. The catalog contains, in addition to illustrations of a great variety of roofing tile products, some splendid examples of beautiful buildings covered with this roofing tile. These beautify the pages of the publication, and along with it they give some good specific information about roofing tile, and incidentally remind us that California ranks as the second largest state in the Union in the production of roofing tile, and has accomplished the feat of obtaining second place since 1904, when the Los Angeles Press Brick Company took up the manufacture of roofing tile on a scale of importance. We are always pleased to see efforts of this kind directed toward the production of burned clay roofing tile and are likewise always ready to lend a hand and help the game along.

CREDIT VERSUS CASH IN ADVANCE.

Under the above caption, a bit of trade literature quite out of the ordinary has been issued by Chambers Brothers Company, Philadelphia, Pa. It tells in detail of their multiple brick cutter No. 10, which, it is stated, is "Built so far as possible to a standard for the construction of machinery of this class. It may be operated continuously at a speed of more than 10,000 brick per hour, yet is usable on machines having an average output of less than 3,000 per hour. It is a brick cutter that does not swell the clay bar. For the whys and wherefores, write for a copy to Chambers Brothers Company. See ads on pages 226 and 227.

TRADE NOTES.

The Lynch Brothers Brick Co., Holyoke, Mass., have put in electric power and are going to double their capacity by installing another brick machine. Each machine is to have its own motor. There is always a good demand for the Lynch Brothers' brick. They have some very large contracts on hand, including two large mills at Lee, Mass., and two jobs at Holyoke.

The Groman Brothers, of South Bethlehem, Pa., have sold out their interest in the Nazareth Brick Co., at Nazareth, Pa. Mr. Thomas H. Groman retires as manager. He is succeeded by Mr. John E. Judd. Mr. Judd is a civil engineer. Under his management the Nazareth Brick Co. will be one of the most up-to-date brick plants in the country. We wish Mr. Judd success. The yard foreman is Mr. Joseph Dolan, who has spent all his life on a brick yard.

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The Aetna Brick Co., Cohoes, N. Y., have started again after a close-down for two years; their shipping was cut off on acocunt of the canal being closed for repairs. They have installed a new machine and made several other changes. They are running a locomotive, taking their brick to the boat for shipment. They are overrun with orders. They make a fine sand struck brick. James H. Courtney is superintendent of the plant.

The New Jersey Co., of Matawan, N. J., has changed from stiff to the soft mud process and are installing their third soft mud machine, which will give them a daily capacity of 187,500 brick. The New Haven brick machine reminds the writer of the old Ford car, it keeps going right along every day. Under the able management of Mr. J. H. Thress, the New Jersey Co. will be one of the most up-to-date yards in the state of New Jersey. They are burning with gas.

DON'T SEE HOW THEY GOT ALONG WITHOUT THEM.

That is the way many users feel about the improved pug mill knives offered the trade by the Manufacturers Equipment Company, Dayton, Ohio. The opinion given by a user in the following letter, which is one of several such complimentary acknowledgments received by the M. E. Co., which has other similarly important devices for the trade, as will be seen by referring to their ad on page 275 of this issue.

The Manufacturers Equipment Co., Dayton, Ohio.

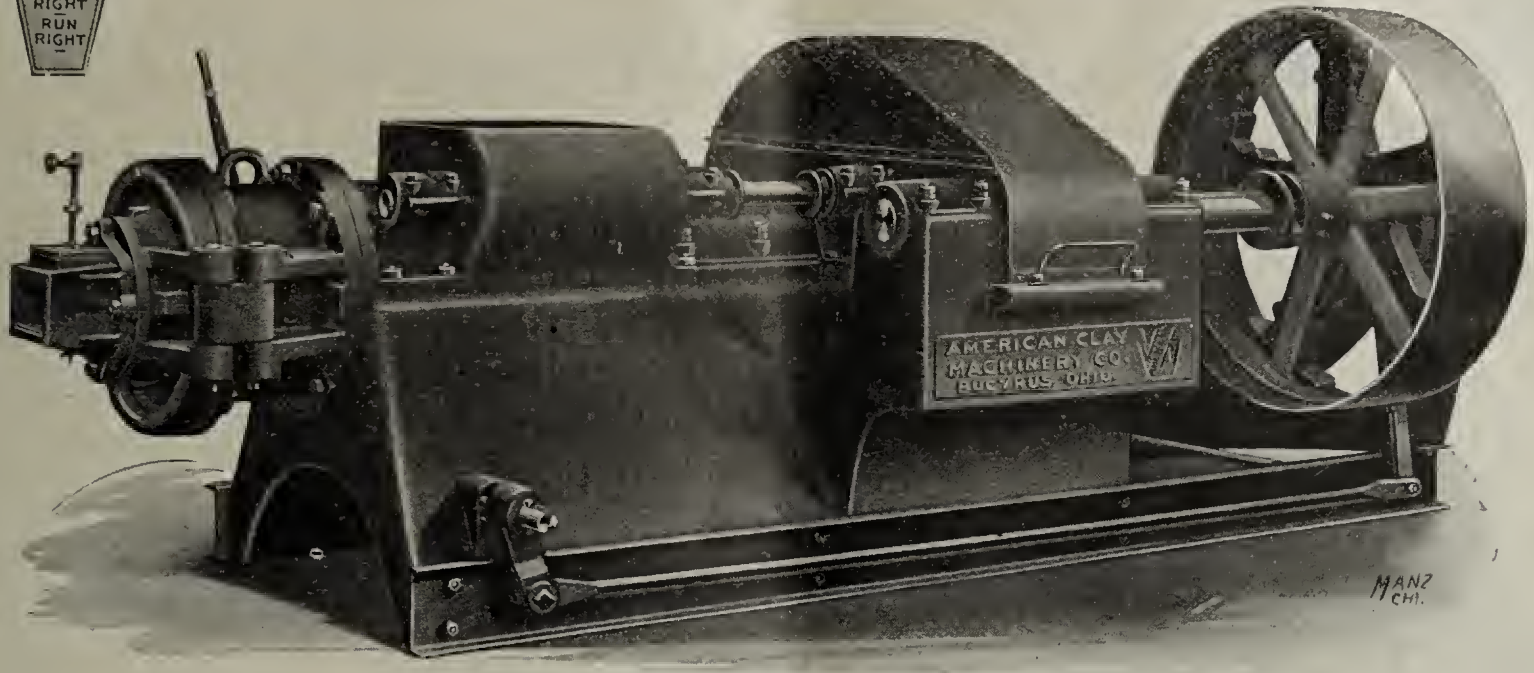
Dear Sirs—When your Mr. J. C. Harris persuaded us to renew the knives on our pug mill, we were skeptical of the results. Much to our surprise the improvement is so great that we do not now see how we got along without them. Formerly, we were able by most strenuous efforts to make a day's work of 25,000, now we could double the amount with ease. We make this voluntary confession of our ignorance and will hereafter listen to reason.

Yours very truly,
PARKERSBURG SHALE BRICK WORKS,
Norton L. Upson, Manager.

Parkersburg, W. Va., August 31.

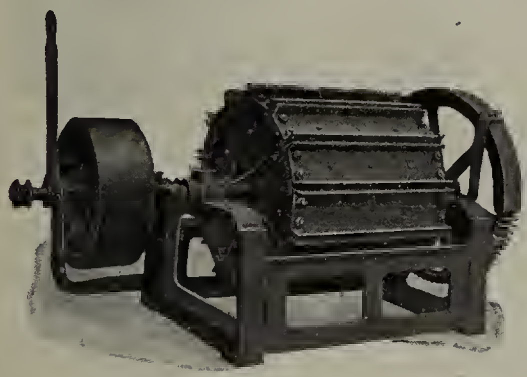
We Build Every Appliance and Machine Needed by Clayworkers.

The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS OHIO
BUILT RIGHT RUN RIGHT



American No. 290 Auger Machine for Brick and Tile.

The American No. 290 Machine has all the elements for heavy duty and capacity. It makes good both as to ware and wear. Get circular on this machine. It's good for a lifetime of hard service.



American Rattler.

The American Rattler

This rattler is built on specifications of the Bureau of Standards and the N. P. B. M. A. To keep track of your brick quality on your own plant is cheaper than to stand rejections. Description of the American Rattler on request.

American Steam Shovel.

The Haigh Kiln

The Haigh Continous Kiln makes big savings for others—why not for you? It costs you nothing to have us show you what your saving will be. Ask for circular and large picture of the Haigh Kiln.

Haigh Kiln.

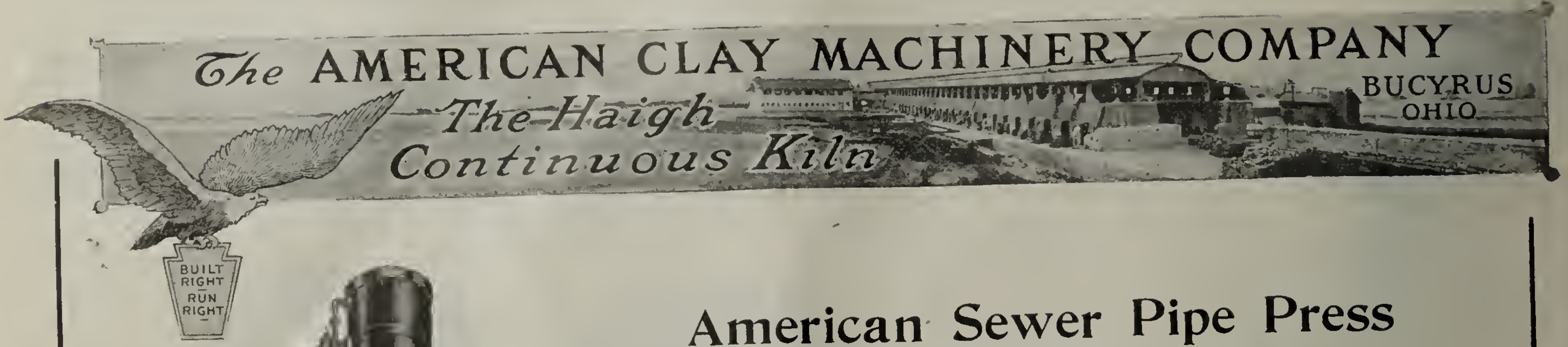
American Steam Shovel

The American Steam Shovel is designed for a full yard dipper and carries a yard. Get catalog.

The American Clay Machinery Co., Bucyrus, Ohio, U.S.A.

Read the American Clay Magazine for September. Just Out.

Ask for One of Our American Flag Bows Free. A New Novelty.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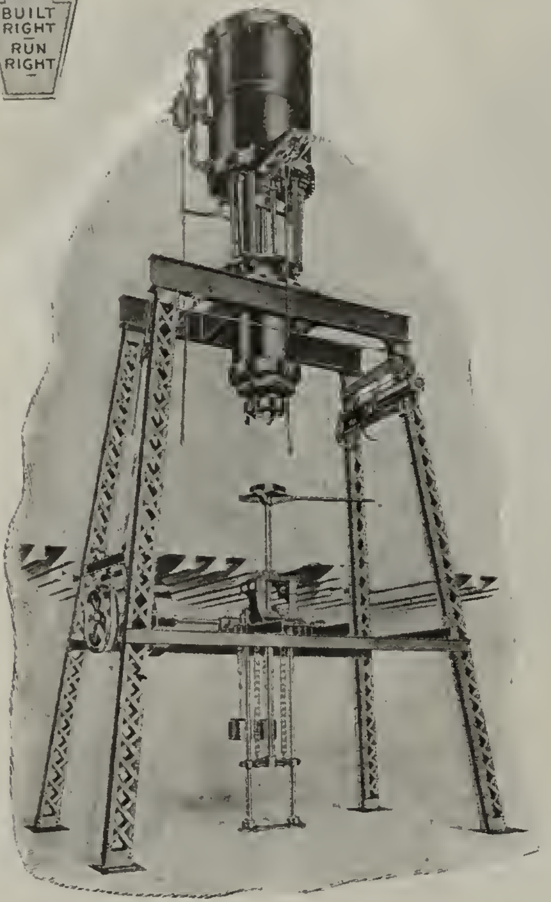


American Sewer Pipe Press.

American Sewer Pipe Press

The American Line of Sewer Pipe Machinery and appliances is complete.

Our Presses have a range of size and capacity to meet any need.

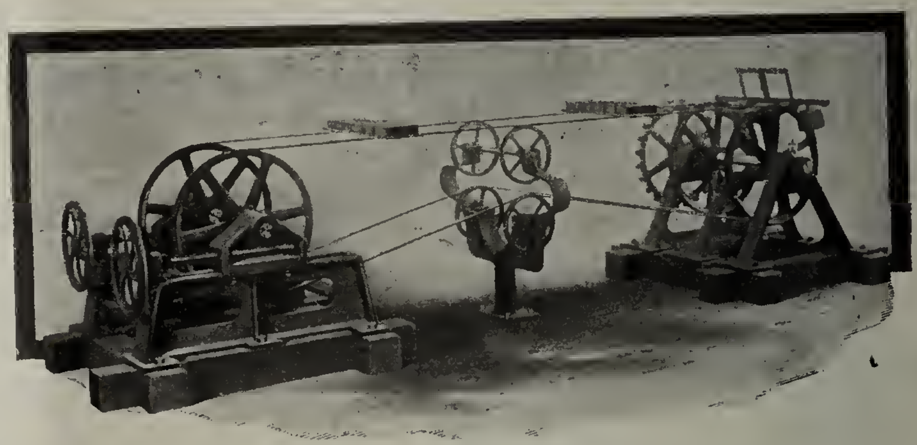
The American Presses are built on substantial lines designed for convenience, economical operation and the production of high grade ware.

The American Line of Appliances include everything required on a sewer pipe plant.

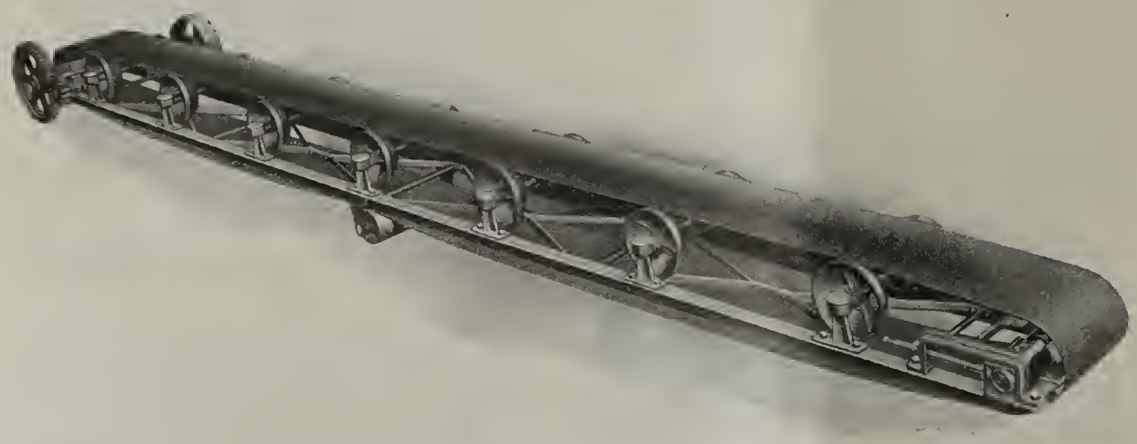
Our Bulletin on this line of machinery is yours for the asking.

American Conveyors

The American-Alsip Conveyor System is adaptable for all soft mud plants and can be used in various ways about the average clay plant. Let us send you a Bulletin on this conveyor.



American-Alsip Conveyor.



American Style "B" Conveyor.

American Style "B" Conveyor

For handling clay this American Style "B" Conveyor will be found to give excellent service.

Built strong. Easy to install. Any length required. Ask for Conveyor Bulletin.

The American Clay Machinery Co., Bucyrus, Ohio, U.S.A.

Largest Manufacturers of Clayworking Machinery in the World.

If It's Used in Making Clay Products We Build It.

The AMERICAN CLAY MACHINERY COMPANY
BUCYRUS, OHIO
The Haigh Continuous Kiln

BUILT RIGHT RUN RIGHT

American Plunger Machines

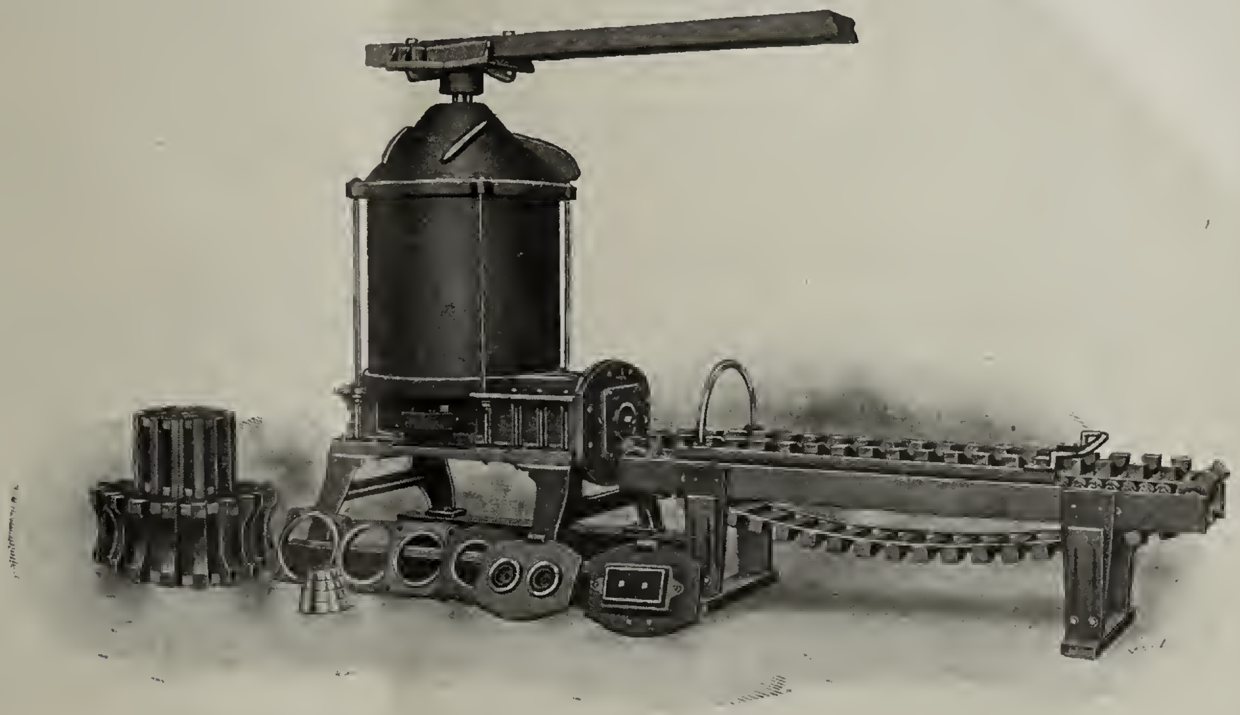
The Plunger Machines we make are adapted to the manufacture of Brick and Tile.

These machines have a wide range of capacity.

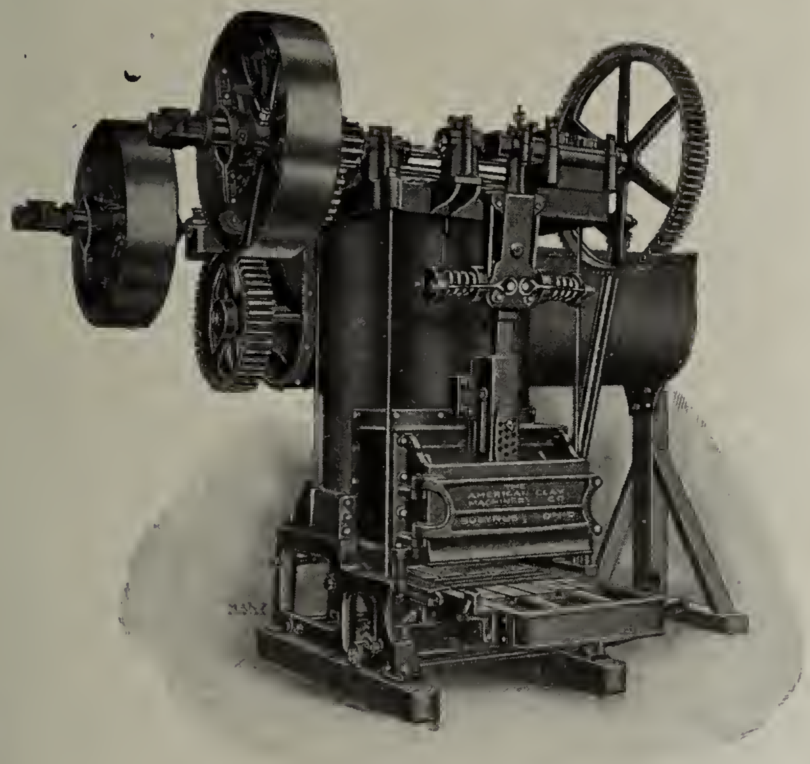
They make a quality product.

Carefully designed and faultlessly built.

Get our Bulletin on Plunger Machinery and appliances.



American Horse Power Plunger Machine.



American Upright Brick Machine.

Upright Brick Machine

A High Grade Brick Machine for making a high grade product. In design it is substantial and convenient. In operation it is economical and profitable.

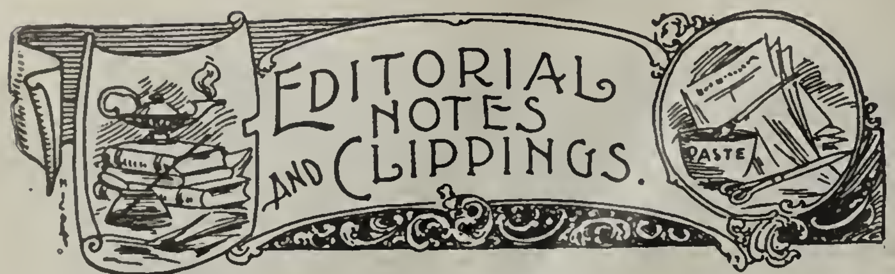
We build all machinery and appliances for making Soft Mud Brick.

Get our Bulletin on this line. It illustrates and describes our soft mud machine line.

We build machinery for making every class of clay products.

The American Clay Machinery Co., Bucyrus, Ohio, U. S. A.

A Quality in Clayworking Machinery Above All Others.



EDITORIAL NOTES AND CLIPPINGS.

The Foster & Son Brick Company, of Boise, Idaho, has filed articles of incorporation, with $50,000 capital stock.

A. L. Gill, C. A. Bursner and D. E. Mitchell, of Pittsburgh, Pa., have filed an application for a charter for the Gillmor Fire Clay Company.

The Ithaca Brick and Tile Company, Ithaca, N. Y., is installing additional equipment to take care of the increased orders for their product.

B. O. Currier has retired from the management of the Western Brick and Supply Company at Hastings, Neb., and has been succeeded by W. F. Overturf.

O. M. Carter, William J. Clark and C. L. Ross have filed articles of incorporation for the Grand Rapids Brick Company, Grand Rapids, Mich., with $100,000 capital stock.

The Gates Fire Clay Company, of Colchester, Ill., has been incorporated by A. W. Gates, Monmouth, Ill.; L. T. and James P. Hall, of Colchester. The company is capitalized at $50,000.

The Chicago Refractories Company, of Chicago, Ill., was recently incorporated with $40,000 capital stock. Those interested are Daniel W. Henry, Edward G. Carey and William M. Quinn.

The boiler at the brick plant of E. H. Long, Sturgis, Ky., exploded recently, fatally injuring one of the employes. The accident occurred at the noon hour, when most of the men were away from the plant.

W. H. F. Parry, the face brick dealer, of Gary, Ind., who gained fame by sending several thousand sample brick by parcel post the first day the parcel post law went into effect, has moved his salesroom and office to 616 Washington street, Gary. Mr. Parry has had a very busy season.

The plant of the Verna Brick Company, at Warra, Minn., which has been closed down for some time for needed repairs, has started operations. Henning Carlson, the superintendent, reports that business is unusually good, with orders on their books for immediate delivery for 1,000,000 brick.

Owing to the fact that their clay supply has become exhausted, the brick plant of the Swartz Supply Company at York, Pa., is dismantling the plant, and the site will be divided into building lots. The plant was formerly owned by L. H. Alwine and brother and had been operated for many years.

Mr. T. W. Garve, for several years past associated with the Richardson-Lovejoy Engineering Company of Columbus, Ohio, and more recently with the Hebron Fire and Pressed Brick Company of Hebron, N. D., has returned to Columbus, Ohio, and taken charge of the business of the Ceramic Supply and Construction Company.

C. A. Horne, T. M. Word, E. C. Stewart and L. F. Weathers, stockholders in the Emerson Brick Company, Atlanta, Ga., recently filed suit against Mell R. Wilkinson, W. H. Camp and Paul F. Akin, also stockholders, by which it is sought to set aside a sale of the property of the company to Mr. Wilkinson and Mr. Camp. This sale was made by Mr. Akin, as trustee, to meet the payment on bonds of the company, which bonds were held by Wilkinson and Camp.

The Western Shale Products Company, of Fort Scott, Kans., has been incorporated with $100,000 capital stock. An immense paving brick plant, modern and up-to-date in every particular, will be erected on the site of the old Fort Scott Brick and Tile Company, which was burned down some time since. M. M. Bushong, who is a paving brick expert of no mean reputation, is at the head of the enterprise, and will have charge of the construction and operation of the plant.

The plant of the Atlanta (Ga.) Mining & Clay Co., situated in Twiggs county, and said to be valued at $200,000, was placed in the hands of a temporary receiver September 11, on application of Joseph Herzfeld and Louis Mayer, creditors of the concern. Sam Herzfeld was named temporary receiver and was directed to make bond in the sum of $2,000 and take charge of the plant. Judge Ellis set the case for hearing on September 23, at which time a plea by the creditors for the sale of the plant and a disposition of the proceeds will be determined.

The Saratoga Fire Clay Company, of Cleveland, Ohio, has been incorporated by F. C. Davis, with $20,000 capital stock.

The West End brick plant at Allentown, Pa., owned by Frederick Brothers, was slightly damaged by fire, recently, which started in the kiln sheds.

The two-story plant of the American Porcelain Company at East Liverpool, Ohio, was partially destroyed by fire last month. The loss is estimated at $35,000.

The main factory building of the Beatrice (Neb.) Brick Company was totally destroyed by fire the latter part of August, causing a loss of $8,000, which was partly covered by insurance.

Charles Smith, a miner employed in the mines of the Hydraulic Press Brick Company at Roseville, O., was caught under a fall of shale and severely crushed before rescued by his fellow workmen.

With a view of increasing the demand for drain tile, the Monmouth Clay Manufacturing Company, of Monmouth, Ill., has issued an attractive booklet, "The Economy of Farm Drainage," which they are distributing to their trade.

Joseph Bussel, for a number of years superintendent of the Indiana Paving Brick Company at Brazil, Ind., has resigned his position and will move to Medora, Ind., where he has purchased an interest in the brick plant at that place.

James J. Allen has purchased a tract of land covering twenty-three acres, at the intersection of Northeast boulevard and Adams avenue, Philadelphia, Pa., on which he will at once erect a modern brickmaking plant, to cost approximately $50,000.

The brickyard of Holt & Gregg, at Anderson, Cal., which has been closed for some time, resumed operations the first of September. One of the reasons for opening was an order from the Diamond Match Company for one and a half million brick to be used in the erection of a large factory.

D. Ross Wynn reports that negotiations have been closed between the Tyronne Brick and Tile Company, operating at Grazierville, just above Tyronne, Pa., and the General Refractories Company, Philadelphia, Pa., whereby the latter company, with which he is so prominently connected, takes over by lease the aforesaid plant.

A deal was closed recently whereby Colburn-Murray Company, of Minneapolis, becomes the owner of the Minnesota Brick and Tile Company plant at Zumbrota, Minn. The new company now has a force of men at work repairing the property and expects to put it in operation about the middle of October.

The Clydesdale Brick and Clay Company, of Pittsburgh, Pa., with a new plant at Elwood, Pa., has become a licensee of the Dunn Wire-Cut-Lug Brick Company, of Conneaut, Ohio. H. J. Orth is president of the Clydesdale Company and W. W. Cunningham, vice-president and general manager. The present daily capacity of the plant of 100,000 paving brick will soon be doubled.

While feeding clay from a platform into the pug mill, Lester Love, an employe of the Norwalk Brick Company, Norwalk, Ohio, made a misstep and his foot was caught in the machine and crushed to the ankle. Fortunately the machine was stopped almost instantly, or the man would have been crushed to death. The physician found it necessary to amputate the foot.

Foster & Son, who recently started a brickmaking plant on a twenty-acre tract just north of Boise, Idaho, now have machinery which gives them a daily capacity of 30,000 brick. Frank Foster, one of the veteran brick manufacturers of Idaho, discovered a bed of blue clay on his land last spring, and he at once proceeded to make good commercial use of the discovery, with the result of the present plant. This plant is second to the largest in southern Idaho. The largest plant is at Pocatello.

After remaining idle for over a year, the Sutherlin (Ore.) Brick and Tile Factory resumed operations early in August, with a full force of men. The plant is in charge of A. R. Foxley, of Eugene, a practical brick and tile manufacturer with over twenty years' experience. For the present the plant will manufacture tile exclusively, for which there is considerable demand throughout this section. About 5,000 6-inch tile and 12,000 4-inch tile will be manufactured daily. The plant is equipped to manufacture 3, 4, 5, 6, 8, 10 and 12-

(Continued on page 274.)

TRADE B MARK

Barrett's PAVING PITCH

Main Street Bridge and Levee Work, Lafayette, Ind. Creosoted Block Pavement filled with Barrett's Paving Pitch.

Wood Blocks with Pitch Filler for Bridge Work

CREOSOTED Wood Block pavement is used largely for bridges by reason of its lightness.

Wood paving has its own peculiar expansion problems. Heat and cold make little difference, but dry weather and dampness make a great deal.

In wet weather the blocks absorb a certain amount of water and expand. The stresses thus set up in the pavement do little harm to anything but the pavement in a city street, but on a bridge, a powerful thrust of the pavement against the rails and copings of the bridge might lead to serious structural damage.

Expansion joints can be provided, of course, but the ideal way is to make "*every joint an expansion joint*" by using Barrett's Paving Pitch as a filler.

This is already fairly common practice but ought to be universal. Barrett's Paving Pitch will last as long as the pavement. Its cost is very low. No skilled labor is required to apply it. It seals the pavement against water, enclosing the blocks and thereby reducing the expansion problem and providing a continuous and unbroken waterproof seal for the protection of the bridge structure.

Booklets free on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

EDITORIAL NOTES AND CLIPPINGS—Continued.

inch tile, but only the 4 and 6-inch sizes will be made this year.

W. C. Stevens and W. S. Shipley, of Macon, Ga., have filed articles of incorporation for the Stevens Fire Brick Company.

The Banfield Clay Company, of Irondale, Ohio, has certified to an increase in its capital stock from $100,000 to $200,000.

The Anaconda Copper Mining Company, of Anaconda, Mont., is installing a four-mold Chisholm, Boyd & White Company Special press for making silica brick.

The Denver Fire Clay Company, of Denver, Col., has been making a number of improvements in its plant, including the installation of a four-mold Special Boyd brick press from the shops of the Chisholm, Boyd & White Company.

The American Ball Clay Company, Philadelphia, Pa., has been organized, with $500,000 capital stock, to deal in and with clay and other minerals and substances. Incorporators are H. Willis Fleu, Ralph Haus, C. W. Gouert, all of Philadelphia.

A terrific windstorm tore off the entire roof of the building of the National Clay Company at Fostoria, Ohio, and carried it fifty feet. The roof was 90x30 feet. The fan house, a building 25x38 feet, was also unroofed. No other damage was sustained.

A. P. Green Fire Brick Company, Mexico, Mo., has established additional sales offices in the following cities: Tulsa, Okla., in charge of George E. Ford; 312 Gallias Building, St. Louis, in charge of Robert H. Miller, and 208 South La Salle street, Chicago, in charge of H. E. Risher.

Chisholm, Boyd & White Company, of Chicago, Ill., recently shipped to the Cole Press Brick Company, Ferris, Texas, three four-mold Special Boyd presses, with dry pans, elevators, mixers, screens and other equipment. The Cole Company expects to have the machinery in operation by October 1.

The construction of the plant of the Tate Tile and Silo Company at Cannon Falls, Mont., is progressing rapidly. The company has a clay field comprising 160 acres, and the clay is rated as first-class for the manufacture of hollow brick and silo tile. It is expected to have the plant in full operation in a short time.

Plans have been made for the reopening of the New Lexington (Ohio) Clay Manufacturing Company, which has been idle for several months. Officers are: President, A. Garlinger; vice-president, J. G. Morris; secretary-treasurer, J. O. Cullen. W. H. Giese, of Cincinnati, is to be general manager, and C. A. Smith, superintendent.

The Johnetta Brick and Coal Company, of Johnetta, Pa., which has been idle for several months, is now in full operation, turning out 60,000 brick per day. The plant has been remodeled from top to bottom, including the installation of the latest improved machinery, which is run by electricity. The plant is being operated on the profit-sharing plan, and is under the management of J. E. Stewart.

The Ohio State brick plant at Junction City, Ohio, recently received an order for 280,000 brick for the Ohio State Univercity, and another order for 100,000 for state buildings at Wooster, Ohio, as well as a number of orders from municipalities. If orders continue to come in, the management will ask to have another "batch" of prisoners transferred to Junction City for work in the plant.

A car filled with ware being shipped from the plant of the Homer Laughlin China Company, East Liverpool, Ohio, was demolished when it left the tracks near the steep embankment. The accident happened when the switching crew attempted to make a flying switch. The car was released from the train, but instead of taking the switch for which it was intended, took another track, and the car toppled over.

Quite a ceremony attended the lighting of the fires in the big continuous kiln of the Glen-Gery Shale Brick Company at Wyomissing, Pa. The plant, which has been idle for almost nine years, has been taken over by the above firm, and three brothers, F. S., A. A. and W. A. Gery, members of the firm, who have been the prime movers in putting the plant in operation again, each applied a silver torch to the kiln which holds 2,000,000 brick. The same torch was used to start the fires in the kiln in 1900, and it is said the kiln burned for seven straight years. No material change was made in the plant, either in machinery, equipment or the kiln, other than minor repairs incidental to starting the plant after being idle nine years.

F. E. Graham, owner of the Emmett brickyard at Boise, Idaho, has been operating the plant since July and is supplying 600,000 brick for the Boise-Payette Lumber Company.

The Watsontown Brick Company, Watsontown, Pa., has had a very busy and profitable season. One of the latest orders booked was for 700,000 brick for a new silk mill at Sunbury, Pa.

While working in a kiln at the Ohio Pottery, Zanesville, Ohio, the walls caved in on J. E. Hale, causing injuries from which it was feared for a while he could not recover. He was completely buried under a mound of brick.

The plant of W. E. Dowlin Brick Company at Billings, Mont., has recently been remodeled and enlarged, and is now one of the largest brick plants in the state. The company takes care of the local demand and also ships to nearby towns.

J. H. Carey, a brickyard proprietor of Richmond, Cal., has brought a damage suit for $50,880 against the city of Richmond. The contention is that the brickyard property was damaged heavily by the construction of the municipal highway from the tunnel to the outer wharf.

While oiling some machinery at the Hebron (N. D.) Fire and Pressed Brick Company's plant, Jack Mayer, an employe, had a narrow escape from a serious accident recently. His clothing became caught in the rapidly moving machinery and was almost entirely torn off, but otherwise Mr. Mayer escaped serious injuries.

The Michigan Face Brick Co., Grand Rapids, is furnishing brick for the school building at Albion, Mich.; Rich Twist Steel Drill Co. factory, Battle Creek; Brown & Sehler factory, city; addition to Eaton Rapids woolen mills; Trinity Reformed, Eastern Avenue Reformed and Wealthy Street Baptist churches, city.

Owing to greatly increased business, S. B. Dobbs, 1218 Chestnut street, Philadelphia, Pa., one of the largest dealers in face brick in the country, has been obliged to enlarge his quarters, and has secured additional space adjoining his present location, and will add materially to his already extensive face brick exhibit. Mr. Dobbs is conservative, but admits that the year has been exceptionally good so far. The office and exhibit will now comprise 303-304-305 Bailey Building.

The Harbison-Walker Refractories Company employs 375 men and boys at its plant at Blandsburg, Pa., and is undertaking the work of making the town a more pleasant place for its workmen to live. The company recently employed Charles E. Graffius as secretary and playground instructors of the welfare work. He will have charge of the $10,000 welfare building the company is erecting this fall for the use of its employes and the citizens of Blandsburg. During the month of August 10,540 persons have visited the welfare grove and playground, or an average attendance of 340 per day.

Three buildings were partially destroyed and ten cars which were loaded with drain tile were burned by a fire which started in a gas-burning kiln at the National Clay Works, at Mason City, Iowa, recently. The fire is believed to have started from escaping gas. The damage is estimated at between $20,000 and $30,000 by George S. Winter, the general manager of the company. A high wind fanned the flames and for a time it was thought the entire plant was doomed, but hard work by the employes of the plant proved effective in preventing the spread of the fire, although the wind carried pieces of burning wood all over the plant.

BRICK MANUFACTURERS PAY HIGH WAGES.

Detroit brick manufacturers have again increased the wages of all men on their yards. This time the wage increase is 40 cents per day per man, no matter what line of work they do on the yards. This makes a total of 90 cents per day the men have been raised this year, and brickyard workers are now the highest paid wage earners in Detroit, outside of the Ford employes that are being paid $5.00 per day. The wages on the brickyards run from $3.00 to $5.50 per day. The wage increase has necessitated the increase in price of common brick to $9.50 per thousand, and stock brick to $10.50 per thousand. There is no let up in the demand, and the Detroit yards will be required to work night and day all winter to prepare for the next spring rush.

THINK!!!

of

THE UNDERWOOD PRODUCER GAS BURNING SYSTEM
PATENTED

THE JUSTICE CLAY PRODUCTS DRYERS
PATENTED

THE MECO SINGLE ROLL ROCK AND SHALE CRUSHER

Then

ACT!!!

By Investigating.

The Manufacturers Equipment Co.
Dayton, Ohio, U. S. A.
Western Agent: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

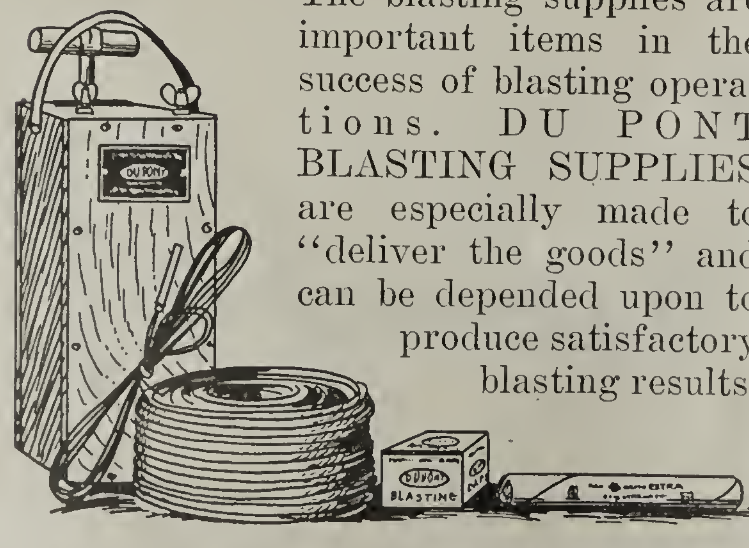
THE USING OF
DU PONT EXPLOSIVES

Will Enable You to Mine Shale or Clay of Any Variety of Formation with Greater Speed, Less Waste and More Satisfactory Results than with any Other Method.

WE have prepared a booklet explaining the use of explosives in this work, covering the subjects, "Blasting Down Shale, Stripping Clay Pits, Mining Plastic and Flint Clays, Draining Clay Pits," etc. This booklet is a practical, helpful explanation of the methods used in the work, and will convince you that blasting is the best and most economical way of getting out your shale or clay.

SEND FOR A FREE COPY OF "EXPLOSIVES FOR SHALE AND CLAY BLASTING" BOOKLET NO. 296.

E. I. du Pont de Nemours & Co.
POWDER MAKERS SINCE 1802
WILMINGTON, DELAWARE



The blasting supplies are important items in the success of blasting operations. DU PONT BLASTING SUPPLIES are especially made to "deliver the goods" and can be depended upon to produce satisfactory blasting results.

BURNING CLAY WARES.

(Continued from page 235.)

As previously stated, the red color in our clay products is due to the ferric iron present and the intensity of the color is determined by the state of division of the mineral. If we start with a clay containing ferrous and ferric oxides, or only ferrous oxide, the first step is the oxidation of the ferrous oxide to the ferric. This begins at a very low temperature and the rate of oxidation increases rapidly up to a temperature of about 1300 deg. F., provided there is no carbon present.

The carbon, as has been stated, prevents the oxidation of the iron and must first be burned out.

As oxidation proceeds the amount of ferric oxide increases as the ferrous oxide decreases, and in consequence the depth of the red color increases correspondingly. We will have the red color so long as the ferric oxide can be maintained in a free state.

At high temperatures, even though there is an excess of air in the combustion gases, oxidation progresses very slowly, practically ceases, indeed some reduction takes place. The incomplete combustion gases satisfy themselves with the oxygen from the minerals in the clay mass given off in the process of fusion, in preference to the oxygen in the air accompanying the gases. At high temperatures then the ferric oxide is being reduced to ferrous, which combines with silica to form a black iron silicate. The color of the ware changes from red, to red-brown, to brown, to dark brown, to black. In the later stages of the fusion undoubtedly the iron in the silicate minerals is having effect in darkening the color.

There are some results which are not readily explainable.

In some clays the red color continues even to complete vitrification; in others the red color changes to a brown almost with the beginning of vitrification and deepens to a black as vitrification advances.

If we color a clay with a solution of iron—sulphate for instance—a red color will develop and continue to a high temperature, but if we use powdered hematite the brown color will appear at a relatively low temperature and darken to black at higher temperatures.

In other words, if the iron is in a chemical state of division the color is red, but if in a mechanical division the result becomes black.

We do not know whether iron can go into combination and retain its ferric form; if so, this would explain the red color under conditions which ordinarily develop, brown or black. In one instance the ferric oxide may simply enter into solution in the fused mass without losing its identity, and in the other instance it loses its identity by combination. It may be that in the chemical state of division the iron coating the grains of the clay mass is in too small a quantity relative to the mass to develop a fusible mixture, or one that is permanent, and in cooling the iron oxidizes to the red color, while in the mechanical state of division such a volume of the black ferrous silicate is formed that the red color is fully mantled. Whatever the explanation, some clays will remain red to complete vitrification while others will not.

Magnesia.

Magnesia occurs in clays as a carbonate (magnesite), and associated with lime (dolomite). It is a common constituent of many silicate minerals, and is nearly always present in clays in small amounts.

It has been claimed that it is an excellent flux in that it acts slowly and lengthens the vitrification range, reduces the tendency to warpage, and produces a tougher product. Its addition to paving brick materials has been recommended.

Our experience with it has not been encouraging. We have found that, when present in quantity such as would with lime give a very short vitrification range, its behavior is very similar to that of lime.

It is better than lime in that at just the right temperature an excellent paving block is obtained, but the vitrification range was too short to be practical and the distortion was excessive. Our work is, however, not conclusive. Parmelee and Bleininger (Vol. XVI. Trans. Am. Cer. Society) state that in porcelain bodies and slags magnesia in mixtures has a longer fusion range than lime and develops a tougher body subject to less distortion. All tests show the beneficial effect of magnesia compared with lime in the production of slag bodies, but in vitrified common wares we do not carry the fusion to such a degree, and it remains to be proven whether the addition of magnesia to a vitrifying material containing neither magnesia nor lime in appreciable quantities will lengthen the vitrifying range and toughen the resulting product.

(TO BE CONTINUED.)

NEW YORK AND VICINITY.

THE MONTH has brought increased instead of diminished prosperity. Business has developed fast all through the month and is today as active as it has been any of the time this summer. New York's building outlook was never better, though temporary scarcity of labor and materials has combined to reduce actual work for a time. It is almost impossible to secure sufficient men to operate the yards, and some of the yards up the river have run only partial capacity because of the impossibility of getting men. In some instances, too, the business has suffered through the impossibility of securing help at old prices. The brickmaker has been forced to give a larger share of his profits to the laborer than ever before, and this has materially reduced his own returns.

Prices hold up well, and it is quite impossible to buy below $8.00 at present, though some say that this price will break before very long. This opinion is contradicted by others who are certain that trade will remain as good as it is now all the rest of the season, and that even higher prices will be paid. Second-hand brick have sold as high as $6.00 in some instances, the scarcity and high price of new brick forcing a high and active market for second-hand brick.

The arrivals are about the same as they have been all summer, and buyers are of the opinion that the consumptive demand will carry out everything easy enough this fall. Some are saying that agents will have difficulty in covering any stock for use next spring. Operations now in progress are counted upon to keep everything cleaned up to the limit this fall and take the market into winter without much surplus to open with next spring.

When asked if prices promise to be lower, manufacturers and dealers shake their heads and say that the situation warrants no reduction.

More and more brick and terra cotta and fireproofing are used in structural operations in and about New York. In counting twenty-five new dwellings in process of erection not far from New York this last week, all but two were of hollow tile. The high cost of all other varieties of building material, including cement and concrete, has turned many builders toward brick. The advertising which manufacturers and associations have done has exerted a beneficial influence, and the trade is feeling its good effects. Ultimately, brick will come into its own, but not until those who make it appreciate the fact that persistent advertising is quite as essential as it is in anything else. What is wanted now is the expenditure of many thousands of dollars in advertising. If that were done next season the sale would be larger than it has been this year, and prices would hold up to new high levels. Only advertising will insure continuous profitable sales.

BURTON.

GANDY and Water

"At times during the night the water in our wheel pit rises as much as three feet, thus covering the lower portion of the belt; at such times it is necessary for us to pump the water out of the pit before starting up in the morning, and wipe the belt off with a piece of waste and start up.

"This belt has been running for several years and working under the unfavorable conditions it does, we have no fault to find with it."

ORDINARY belting can not stand up if subjected to the ravages of frequent wetting. Here Gandy differs from ordinary types of belting.

While all users of belts do not experience the "flooded wheel pit" trouble this immunity to water and the other advantages that Gandy Belts possess in being proof against dust, heat, gas, steam and oil provides a measure of dependability that is invaluable in preventing shut-downs when the unusual *does* occur.

Our Service Department, which is under the direction of competent engineers, will advise you in an entirely unbiased manner if you can use Gandy with profit.

You will not obligate yourself in the least by describing the belt service you require.

The Gandy Belting Co.
749 W. Pratt St., Baltimore, Md.
New York Branch,
36 Warren St.

Westinghouse Motor Driving a Dry Pan.

Why Motor Drive is Best

No. 1.

Throw off the belts from all machines and test the power it takes to operate the line shafts; you will be surprised to discover what a large percentage of power is wasted.

Westinghouse Individual Motor Drive

with central station power—saves power bills—when the motor stops the power cost stops—machines can be arranged so that handling of material is reduced to a minimum.

A card brings booklet 3072.

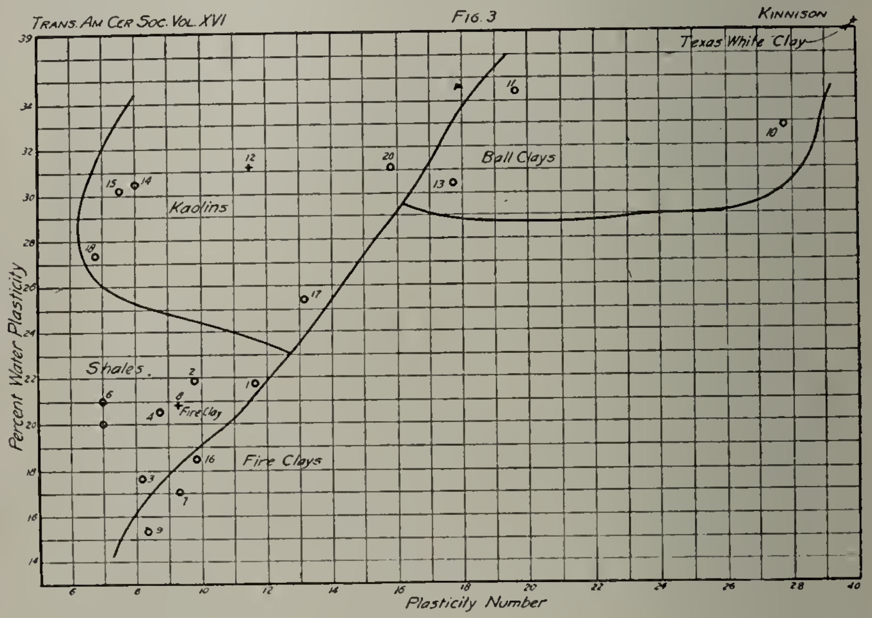
Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.
Sales offices in all large American cities.

A STUDY OF THE ATTERBERG PLASTICITY METHOD.

(Continued from page 237.)

About two grams of each clay were accurately weighed in small tin capsules, after having been taken to dryness at 110 deg. These were then put into a desiccator containing the acid solution; weighings were then made at the end of seven and fourteen days, and then about every two days until practically constant weight was attained. It can be readily seen that changes in temperatures will affect the weight of the clays inasmuch as the vapor pressure of the solution changes with the temperature. In case of a fall in temperature there results a loss in weight due, of course, to the evaporation of the water from the samples. This is only noticeable when the clays practically reach their maximum weight, because, as this point is approached, their rate of increase in weight is very slow.

For carrying on Atterberg's test, the clays were thoroughly mixed and screened through 80 mesh, and the method recommended by him followed as accurately as possible. However, instead of using a shallow evaporating dish for determining the flow limit, a flat vitrified porcelain disc was substituted, because when the former was used, there seemed to be a tendency for the clay mass to slide, instead of to flow. This trouble was eliminated by the use of the flat disc. Atterberg does not specify the width which shall separate the two portions of clays, but in our case this distance was made about ⅛ in. Nothing is definitely stated concerning the vigor or number of blows which shall be given to bring about the flow, and, of course, the more vigorous and frequent are these blows the lower will be the flow limit. In our work the disc was sharply rapped 25 times against the heel of the hand, care being taken to make the impacts of as near the same intensity as possible. Of course, these could not be made exactly equal in each case, and thus constitutes one source of error. We would suggest that a mechanical device of some sort such as a vibrator be used for this determination. It seems furthermore that these impacts should be made against some rigid object instead of the hand. This method classifies the clays as shown in column (D), the most plastic clay being given last position or position No. 20.



It will be noticed from this classification that in several instances the plasticity numbers practically or entirely coincide. According to Atterberg these clays are of practically the same plasticity. The plasticity number obtained merely by difference does not show the location of the clay in its own particular class. For instance, the plasticity numbers of clays, No. 7 and No. 8, coincide; it will be noticed, however, that the water contents do not agree, the difference being approximately three per cent. Clays No. 1 and No. 12 also agree very closely in their plasticity numbers, and yet have a difference of 11 per cent in their water content. See Fig. 3.

As seen in Table I, clay No. 1 is the Bedford shale and No. 12 Great Beam ball clay. They are both very plastic, but we know, of course, that the ball clay is much more so, but yet has a slightly smaller plasticity number. Now, the plasticity number, as determined by Atterberg, does not take into account this consideration, just mentioned. It seems logical that a clay having the higher water of plasticity content and yet the same plasticity number as some other clay would be more plastic than the latter. The facts would be more clearly represented if these numbers were multiplied by some factor, to take into account this difference in water content. For instance, multiply by the per cent water of plasticity. Such a procedure gives the classification, in column marked (BxD), Table III.

TABLE III—CLASSIFICATION BY ALL METHODS USED

Clay No.	AxB	A Shrinkage	B Water Plast.	Atterberg	BxD	C Vapor ABS.	Av.	Off Att.	Off AxB	Off C	Off BxD	Off B	Off A
1	9	13	9	14	14	14	12	2	3	2	2	3	1
2	12	14	10	11	12	7	11	0	1	4	1	1	3
3	2	3	3	6	4	2	3	3	1	1	1	0	0
4	3	1	6	8	5	6	5	3	2	1	0	1	4
5	4	2	5	2	1	9	4	2	0	5	3	1	2
6	6	5	8	3	2	3	5	2	1	2	3	3	0
7	5	7	2	9	9	5	6	3	1	1	3	4	1
8	8	10	7	10	10	8	9	1	1	1	1	2	1
9	1	4	1	7	6	13	5+	2	4	8	1	4	1
10	18	18	19	19	19	19	19	0	1	0	0	0	1
11	19	19	18	18	18	18	18	0	1	0	0	0	1
12	15	17	17	13	15	17	16—	3	1	1	1	1	1
13	16	16	14	17	17	16	16	1	0	0	1	2	0
14	14	11	15	5	8	1	9	4	5	8	1	6	2
15	13	9	13	4	7	4	8	4	5	4	1	5	1
16	7	12	4	12	11	12	10	2	3	2	1	6	2
17	10	6	11	15	13	10	11	4	1	1	2	0	5
18	11	8	12	1	3	11	8	7	3	3	5	4	0
19	20	20	20	20	20	20	20	0	0	0	0	0	0
20	17	15	16	16	16	15	16	0	1	1	0	0	1
								43	35	45	27	43	27

Arranged in the inverse order of their gain in weight when subjected to a vapor tension, the clays are classified as shown in column (C).

It will be noticed that this order checks quite closely with that given in column marked (AxB). There are, however, three cases where the arrangement is widely different, viz., in clays Nos. 9, 14, 15. The first of these clays is that of the Chicago Retort and Fire Clay Co., and has excellent working properties, yet column (AxB) classifies it as the poorest of the lot. Clays No. 14 and No. 15 are both china clays whose working qualities are only fair, yet they are ranked with the most plastic by column AxB, and given decided preference in position over clay No. 9. Our common everyday experience with these clays would undoubtedly make their arrangement as given under column (C) seem the more nearly to represent the facts.

In determining the amount of water absorbed, we do not agree with Keppler, however, in recommending that the samples be under a vacuum at the same time. A vacuum should at first be produced to remove the air, but should not be maintained. The vacuum will gradually fall, of course, due to the evaporation of the water.

If the vacuum be maintained the vapor pressure is lowered so much that the operation is much too slow, and also makes the results inaccurate. When the samples were weighed at the end of the 15th day, after being subjected to the vacuum continuously, they were found to have attained a practically constant weight. When put back into the humi-

(Continued on page 280.)

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Columbus, Ohio

A STUDY OF THE ATTERBERG PLASTICITY METHOD.

(Continued from page 279.)

dor, however, the suction cut off, they gained rapidly, the rate of increase being more than three times that when the vacuum was used. The order, based on the gain in weight when in the vacuum, scarcely agrees in any way with those given by any of the other methods used.

In an attempt to draw conclusions as to which of the methods used most nearly represented the facts, the "average position number" was determined, as shown in column marked "Av." The difference between this value and those given for that clay by the other methods was determined, and the figures so obtained arranged in the columns as shown, which show how far off the average position are those given by the methods used.

It is interesting to note in this connection that the total points off the average, as shown by column AxB, is exactly the average of the variance from the average, as shown by columns A and B. It is also seen that the order as given under column BxD is nearer to the average than either arrangement under B or D.

These figures have no particular significance other than to show that the Atterberg method is no improvement over any of our own, and that the old method of classification based on the per cent volume shrinkage is about as satisfactory as any that we now have.

None of the methods seem to exactly show the facts as we judge them from experience. However, a classification based on all of these methods should reveal the facts fairly accurately, but no one method with which we are now familiar will suffice.

Arranged according to AxB, the Chicago Retort and Fire Clay Co. clay is the least plastic, but such is not the case. North Carolina kaolin is ranked among the best by this method, while as a matter of fact it is the least plastic of the lot, and Atterberg's method places it where it belongs. Similar misrepresentations could be shown for all the methods employed, and none has any decided advantage.

In conclusion, Atterberg's method itself is open to one sharp criticism, namely: that the plasticity number does not locate the clays in their respective classes. We might say it is analagous to two equations, with three unknowns. Thus, for instance, the Bedford shale is classed along with the Great Beam ball clay.

In order to correlate the Atterberg valuation with the actual character of the clay it is suggested that a diagram be used as shown in Fig. 3. Here the Atterberg plasticity number is co-ordinated with the water of plasticity.

DISCUSSION

Mr. Watts: I have been very much interested in this paper, especially because of the fact that we have been endeavoring to make some physical measurements of clays at the Ohio State University, and the problem of measuring plasticity has come in for its share of attention. We had only the data that, up to the present time, have been available along this line, and felt rather helpless in devising schemes for measuring plasticity, but we finally hit upon a combination of tests which includes the following:

The first test was the knife test; that is to say, the wedging of clay until it became plastic, adding water at frequent intervals and in small amounts. In order to determine the exact point, we took a small, sharp spatula of the regular four-inch size and, having the blade smooth and sharp, cut a slash through the molded clay. After doing this, we pressed the blade of the knife flat on one side of the cut to determine whether or not there was any evidence of healing. We took the point where the clay united as one of our end points. We found that twelve of the clays which we tested in that way checked up in rather fair order. For the second point, we used a No. 12 nickeled brass wire loop, ½ cm. in diameter. These loops were carefully made; and we continued to add water to the clay, which now became slip until by having a depth of about half an inch of this plastic clay, and passing the loop along the bottom of this clay mass and drawing it up through the clay, we just retained a globule of clay in the loop. The addition of one-half of one per cent of water resulted in the refusal of the loop to retain a globule of clay. Water was then added until we obtained a slip that would again adhere as a globule on the loop. This, you will understand, was a very thin slip, and was approaching the watery or milky stage only. That gave us three points which we could correlate, and we found some rather interesting results in the preliminary investigation. I do not know how successful we shall be in this, because the major portion of the work is being done by students, who are now juniors, and the personal factor, of course, comes in, but we are very much in hopes of getting some data which we shall be able to correlate. We see every evidence of the clays lining up by this system of tests into about the same classification as they would be normally placed by the average potter who depends simply on his judgment and his acquaintance with the various clays in deciding the order into which they should fall.

Mr. Back: I should like to ask Mr. Kinnison what drying treatment he gave the clay samples which were used in the absorption test in which sulphuric acid was employed.

Mr. Kinnison: I merely took them to constant weight at 110 deg.

Mr. Back: How heavy are the samples when dry?

Mr. Kinnison: About two grams.

Mr. Back: How do you account for the fact that when you removed the vacuum and put the samples back you find increased absorption?

Mr. Kinnison: Evidently the increased absorption is due to the increased amount of vapor.

Mr. Back: Was your vacuum always the same during the absorption treatment of the several samples?

Mr. Kinnison: Practically so; they were all subjected to the same treatment.

Mr. Back: I asked this question because in this absorption test, which is practically the Rodenwald-Mitscherlich hygroscopicity test, this drying treatment would not apply to humus soils because the humus would be so affected as to give a lower absorption value for the soil than it actually has. Possibly a similar error is introduced when working with clays and clayey soils if such a drying treatment is used. It might be better to accomplish the drying by desiccating with P_2O_5 for example, and eliminate the application of heat.

Mr. Kinnison: The only point is to obtain some figures on which to base the increase in weight.

Mr. Back: If the drying treatment is the same for all samples, it may be alright as far as obtaining samples of equal weight is concerned; but not so for the absorption results which are determined, because any effect, which organic matter might have, would be altered and possibly eliminated under such heat treatment.

Chevalier & Tully, of Baltimore, have just completed a plant, in which specially designed machinery has been installed for the production of what will be known to the trade as "K-10" clay. This material will replace the famous Klingenberg clay, in the manufacture of graphite crucibles, lead pencils, carbon brushes, emery wheels, and other products wherein a very plastic and highly refractory clay is required. Plans are being prepared by Chevalier & Tully for a plant double the size of the present one, which they hope to have completed November 1, and thus enable them to supply the heavy demand that has been made upon them for "K-10."

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If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

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DENNIS SYSTEM OF KILNS AND DRYERS.

(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

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BROWN, BLACK, RED AND BUFF.

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EASTON, PA., U. S. A.

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Chattanooga, Tenn.

Manufacturers of

Red Oxides for Brickmakers' Use.

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You Want to Sell or Buy...

Second-hand Clayworking Machinery, Tile Mills, or anything pertaining thereto.

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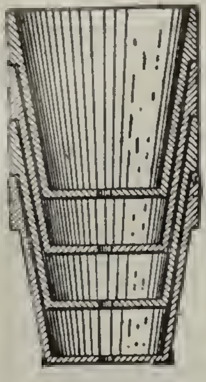

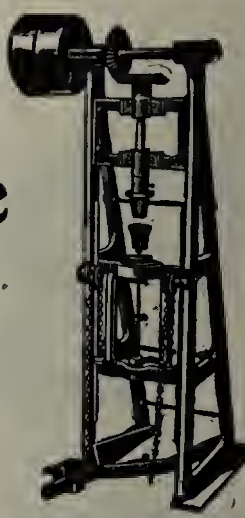

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No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

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A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

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T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

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PITTSBURGH, PA.

Builders of
Pittsburgh Standard
Dry and Wet
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

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Stephen Girard Bldg.
Philadelphia, Pa.

$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) **$2.00**

The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Soiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

The Old Way

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen. Lew Wallace, the author of "Ben Hur," wrote: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

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The New Way

THE ROESSLER & HASSLACHER
Chemical Company
New York

PREVENT SCUMMING
by treating your
BRICK & TERRA COTTA CLAY PRODUCTS
during process of manufacture with our
PRECIPITATED CARBONATE BARYTES

Make Your Slogan
"SCUMPROOF PRODUCTS."
Write for literature.

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HIGH GRADE CHEMICALS
COLORS and OXIDES
for
Brick, Terra Cotta
Tile, Clay Products
Also
Pottery, Glass
And Enameled Ware

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A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

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277 Hawthorne Ave.
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BOLT IT TO THE BIN!

Investigate the

COLUMBUS CLAY FEEDER

for

DRY PAN and PUG MILL.

"O. K. in every respect, and considered one of the most important machines on our plant."

—*Extract from one of many letters.*

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COLUMBUS, OHIO

SCREENS
ELEVATORS AND CONVEYORS
OHIO DRAFT GAUGE

SCUMMING AND EFFLORESCENCE

BY

ELLIS LOVEJOY, E. M.

This is the finest treatise on the subject ever written. Every angle of the cause and best method of overcoming the scumming and efflorescence on brick is given in detail.

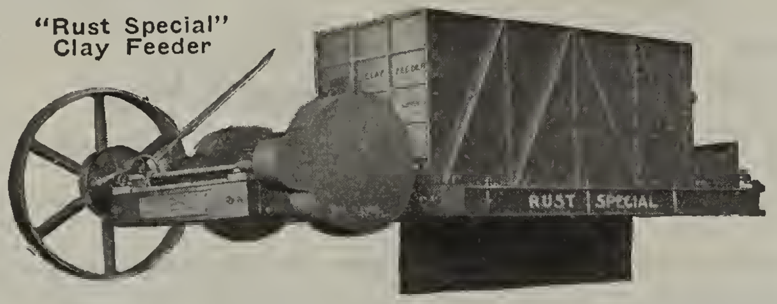
ONLY 50 CENTS THE COPY.

T. A. RANDALL & CO.

INDIANAPOLIS, - IND.

Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special"
Clay Feeder



Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your offbearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

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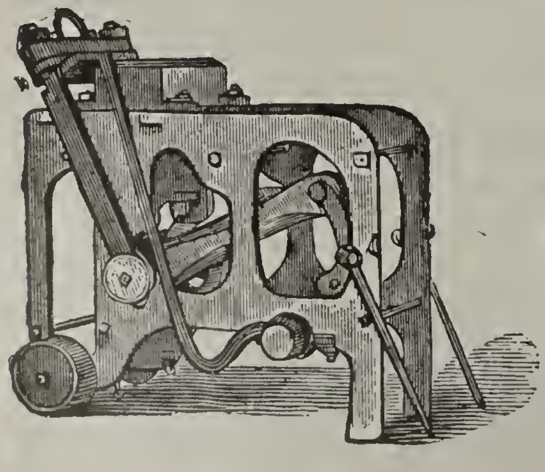
MILWAUKEE, WIS.

Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.



RED BRICK PRESS.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞Send for Circular and Price List.

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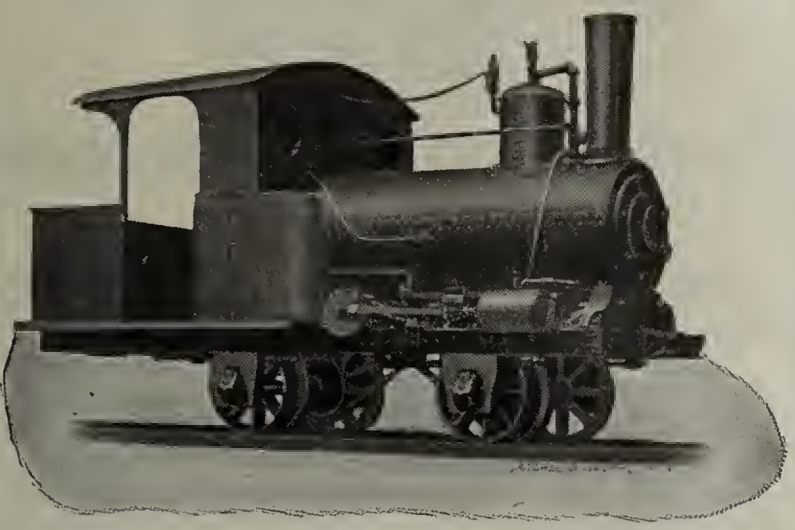
INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

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Consulting Engineer
COLUMBUS, OHIO

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Geological Examination of Properties

Clay Testing

Investigation of Manufacturing Propositions

Plants Designed, Construction Superintended and Operations Directed

Dryers, Furnaces, Kilns

Remodeling Old Plants Given Special Attention

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Do you know, dear reader, that when you buy magazines from month to month you are paying from one-fourth to one-half more than you need to?

		Our Price
CLAY-WORKER	$2.00	$6.50
The Mantel, Tile and Grate Monthly	2.00	
McClure's	1.50	
Current Literature	3.00	
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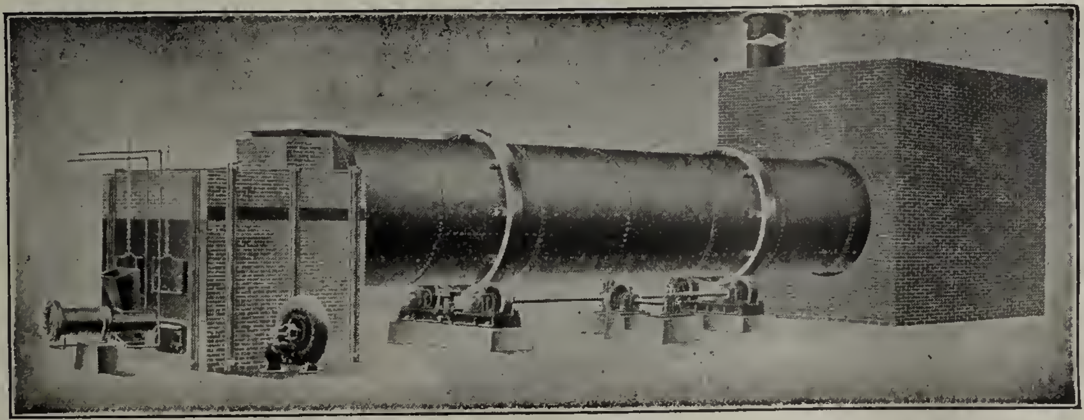
Address all orders to **T. A. RANDALL & CO., Inc., Indianapolis, Ind.**

PYROMETERS

Brown Pyrometers will mean more uniform burning of your kilns, less fuel consumption, better ware. Why not install them as all progressive concerns are doing?

Brown Instrument Co.
Philadelphia, Pa.
New York Pittsburgh Chicago
Chamber of Commerce Bldg., Detroit



ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
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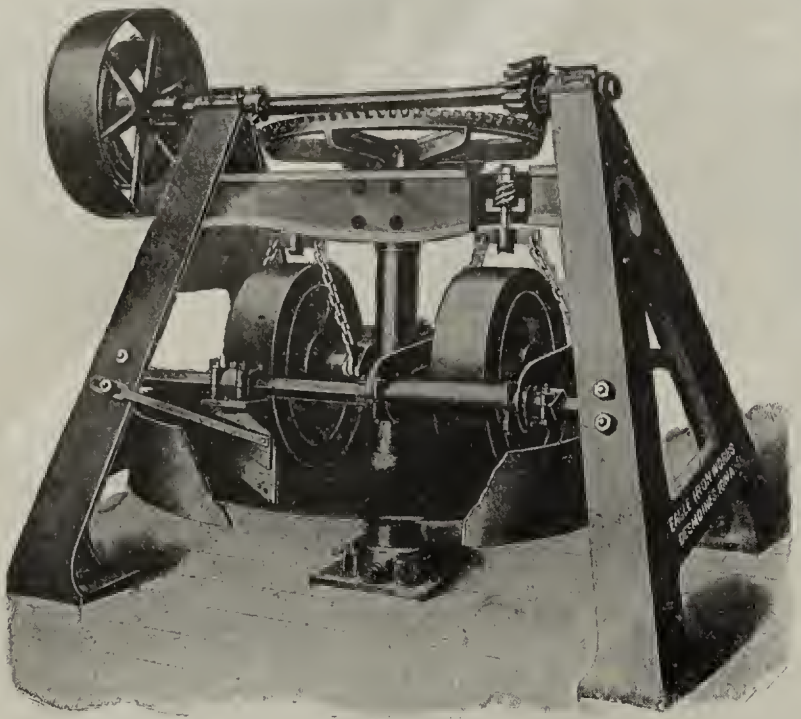
Independent and Suspended Mullers
the distinguishing feature of our DRY PANS



Other valuable features which our catalogue fully describes.

EAGLE IRON WORKS
Des Moines, Iowa

HOLES

SOLD and GUARANTEED
It's The
Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.
We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

Metallic Radiation Heat Dryers

Write for detailed information

IMPROVED KILNS AND DRYERS
KILN FLOORS AND FURNACES

Brick & Clay Engineering Co.
(Inc.)
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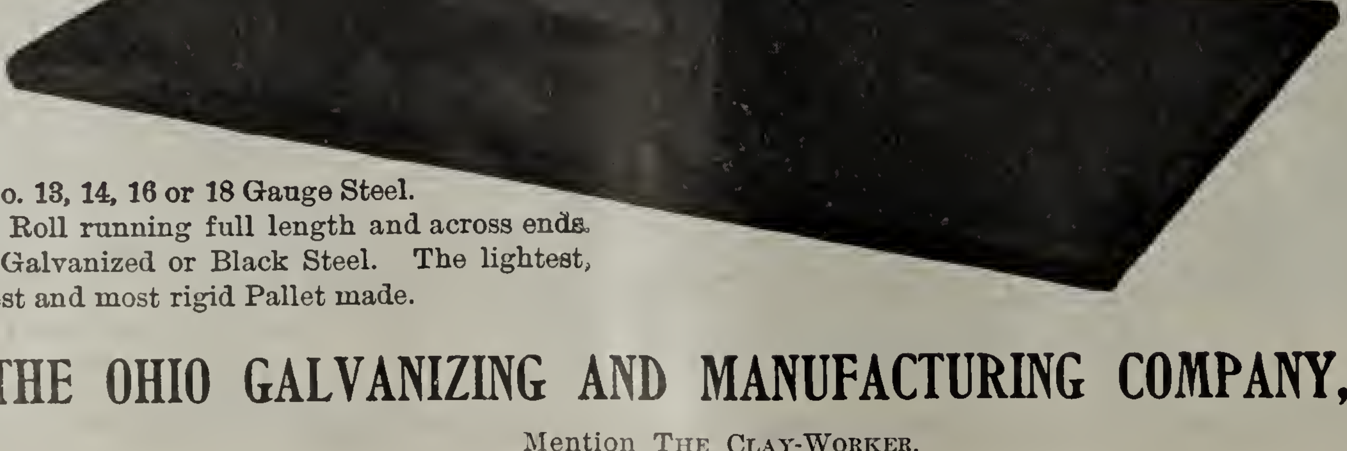
"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.
(Patented.)



Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends. Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

GOLD MEDAL AWARD

PANAMA PACIFIC EXPOSITION
for

THWING

HIGH RESISTANCE MULTIPLE RECORD

PYROMETERS

Their Merits Are Vouched for by Hundreds of Satisfied Users.

Ask for Our New General Catalog No. 8.

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LABOR REDUCED
COST REDUCED
QUALITY INCREASED
QUANTITY INCREASED
by using

The National Steam Drier

Ask us about it.

The National Dry Kiln Company
1117 East Maryland St.
Indianapolis Indiana

Over 300 Brick Manufacturers Using Thew Shovels

42 Thews in Cleveland.

Ask The American Building Brick Co.; The Barkwell Brick Co.; The Cuyahoga Brick and Shale Co.; The Deckman-Duty Brick Co.; The Farr Brick Co., and *The Ohio Clay Co.* what they think of their *Thews.*

Let us show you *Thews operating* that have been *in continuous service over* 15 *years.*

Last year the sign read 37 *Thews in Detroit.*

The Thew Company refers you to any Thew Shovel owner anywhere.

They do this because the *policy of the Company will not permit a Thew* to be *sold* to *any one unless* it *can give good results.*

The *Thew reputation for fair dealing* is *too valuable to sacrifice for a few orders. If the Thew cannot help you, they do not want you to have one.*

The First Thew Shovel Still in Service.

Here is what the owner of the *first Thew Shovel* says after it has been *in continuous service over* 21 *years*: *"No better shovel was ever put up. It is not very handsome to look at, but it is very economical in operation and does its work without any trouble. We can't say anything too good about the shovel."*

Use a Thew--It Pays.

Write for Circular 22-F.

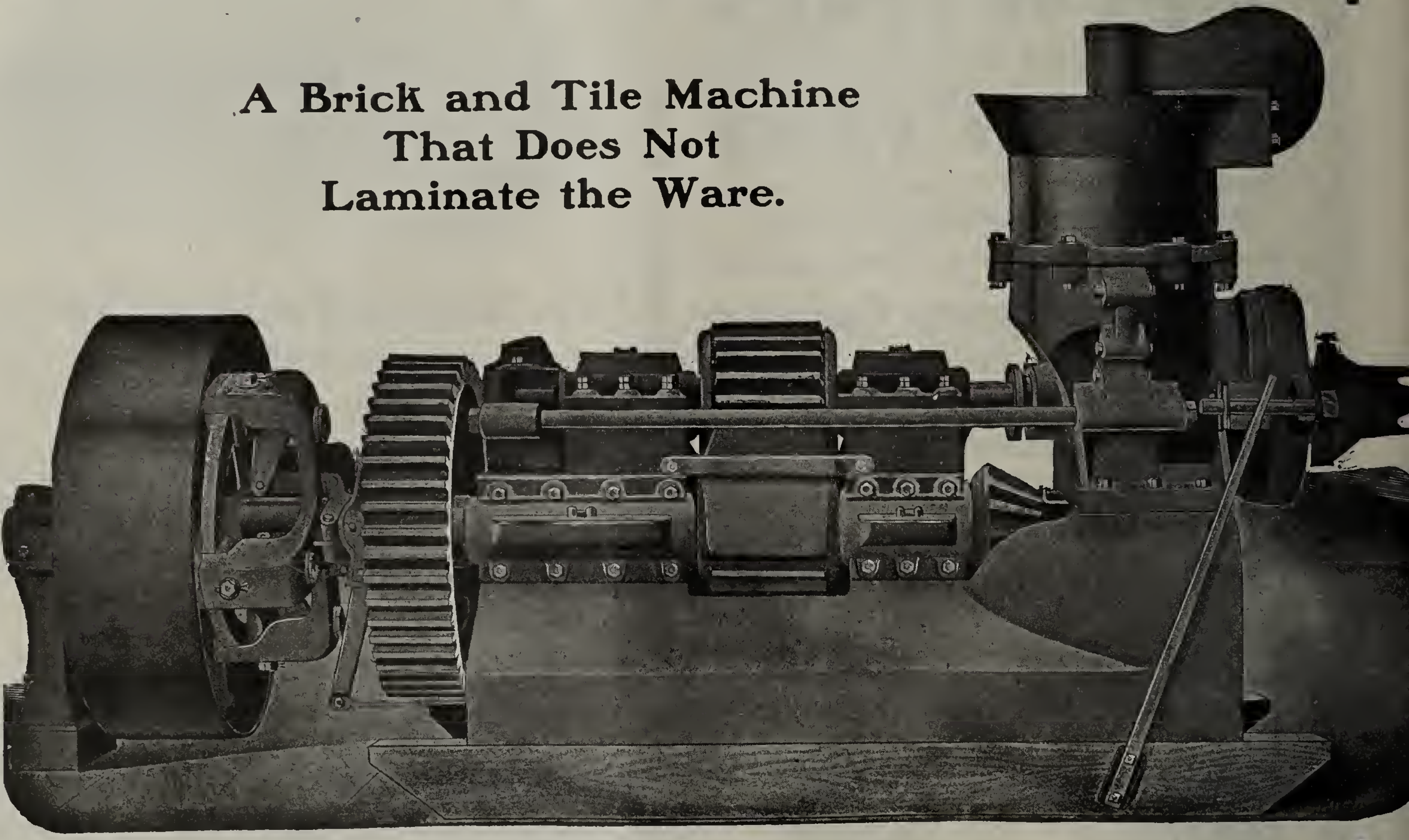
THE THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

A Brick and Tile Machine
That Does Not
Laminate the Ware.



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

THE WALLACE MFG. CO.

FRANKFORT, IND.

Drying Clay Wares

By Ellis Lovejoy.

Author of

Economies in Brickyard Construction and Operation.

Scumming and Efflorescence.

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Mr. Clayworker:

Your library of ceramic literature is not complete without

DRYING CLAY WARES.

This splendid treatise covers every phase in the drying of any kind of clay ware.

It is the most valuable book of all our ceramic literature.

It is so terse and simple in its diction that it does not require a second reading to get the meaning.

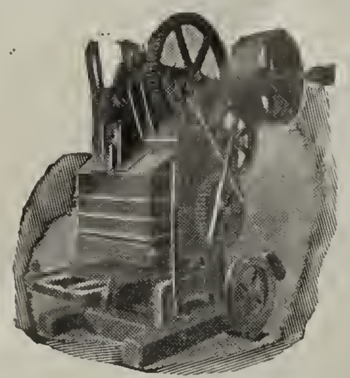
The remarkable grasp of the author on this subject, his clear language, the detailed discussions and the arrangement of the subject matter make this book most interesting.

It is splendidly illustrated with sketches of the various types of dryers, etc.

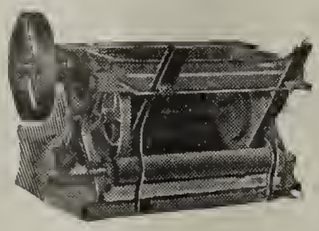
The price is $2.00.

T. A. Randall & Co.
Publishers
Indianapolis, Ind.

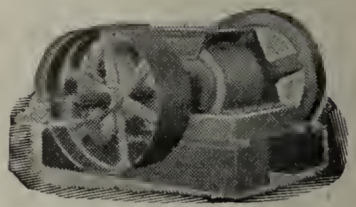
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.



Vertical Brick Machine



Style "A" Mould Sander



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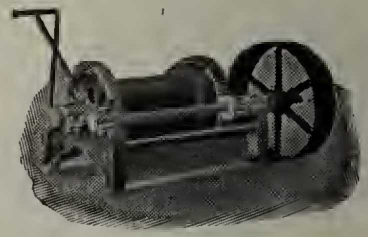
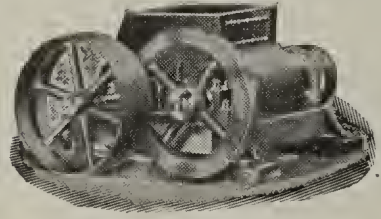


Style "B" Winding Drum



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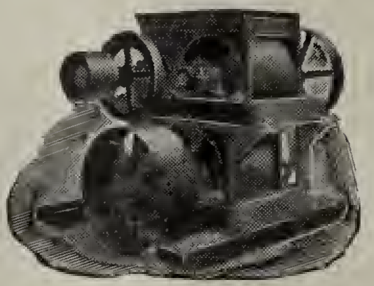
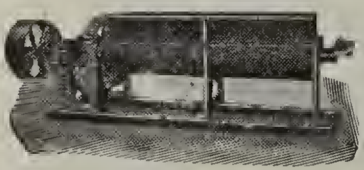
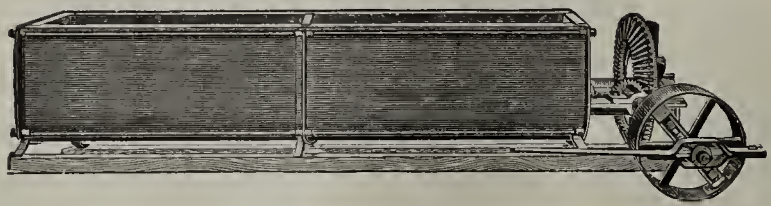


Style "P" Compound Disintegrator and Crusher

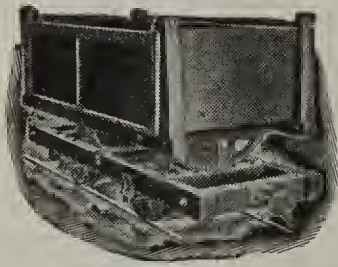
Mule Truck



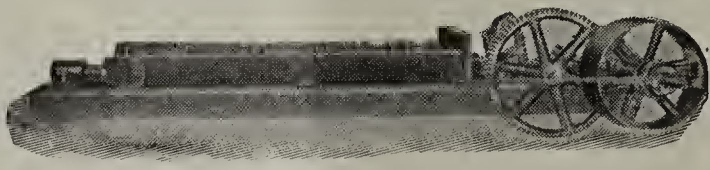
Double Geared Pug Mill



Single Geared Pug Mill



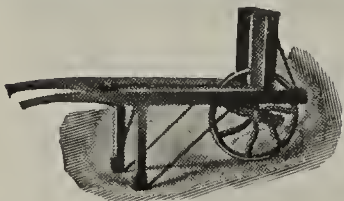
Side Dump Car



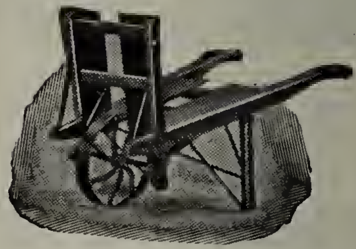
Feeder or Granulator

Bottom Dump Car

The Potts Rocker Grate
For any size fire box
on boiler or kilns



No. 6 Barrow



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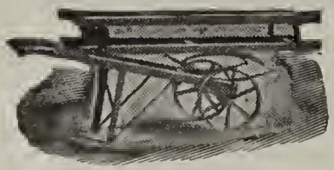


Double Deck Truck

Clay Elevator.

Single Deck Truck

C. & A. POTTS & CO.

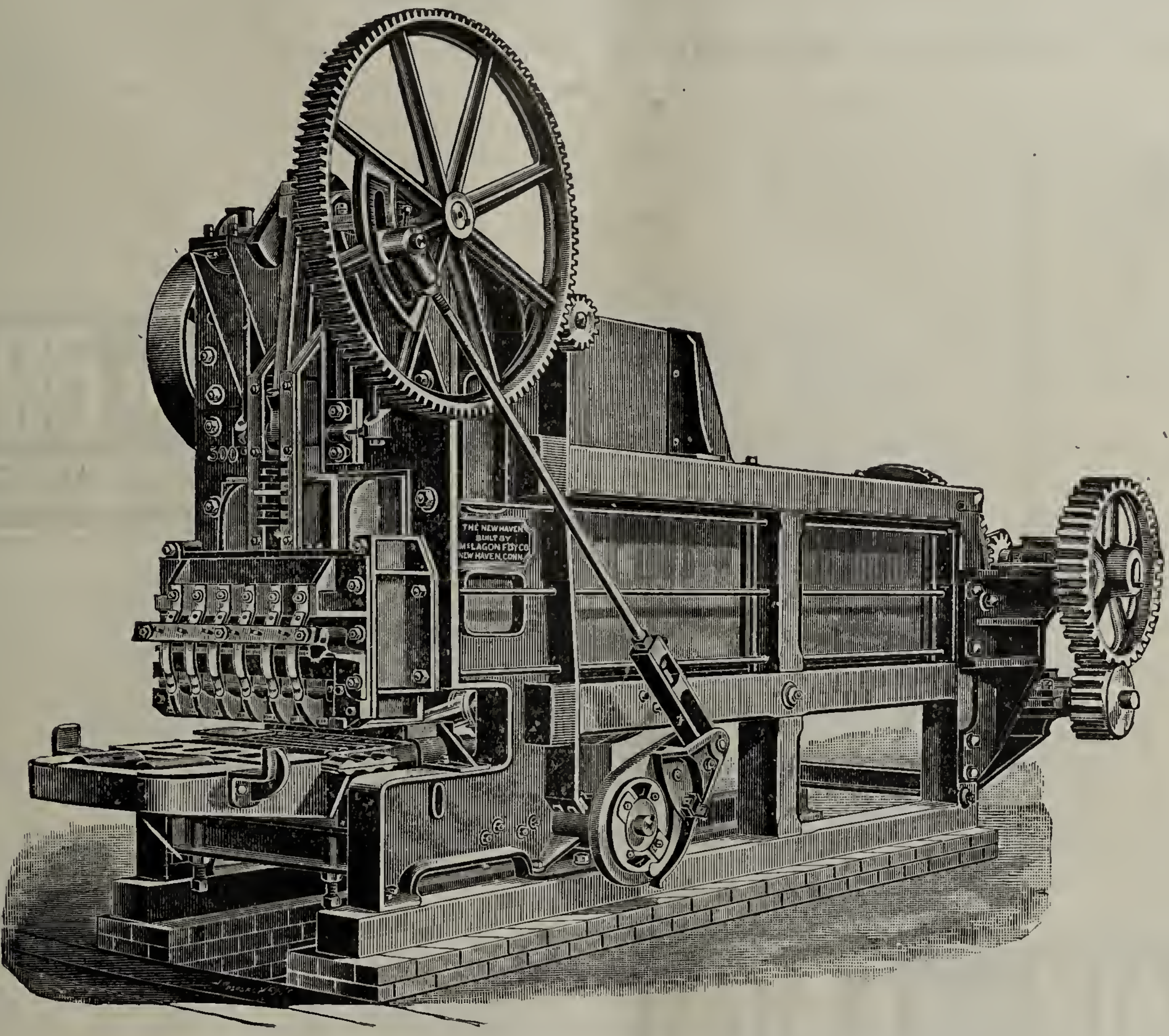
INDIANAPOLIS, IND.

Write us for Prices.

If it's to be Had We Have it.

CHARACTER and REPUTATION

"Character is what we are. Reputation is what people think we are." A happy combination is when character and reputation agree, as is the case with the New Haven Soft Mud Brick Machines. They are built so strong and so well that the character and reputation both is unquestioned.



"NEW HAVEN" HORIZONTAL BRICK MACHINE.

The enduring qualities of the New Haven Machines have won for them the approbation of soft mud brick manufacturers generally, and New England brick manufacturers in particular. If you want a soft mud brick machine that will insure steady operation, high-class products and regular dividends, buy a New Haven.

The EASTERN MACHINERY CO.

NEW HAVEN, CONN.

JOIN THE

BOOST **BOOST**

BUILD WITH BRICK

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

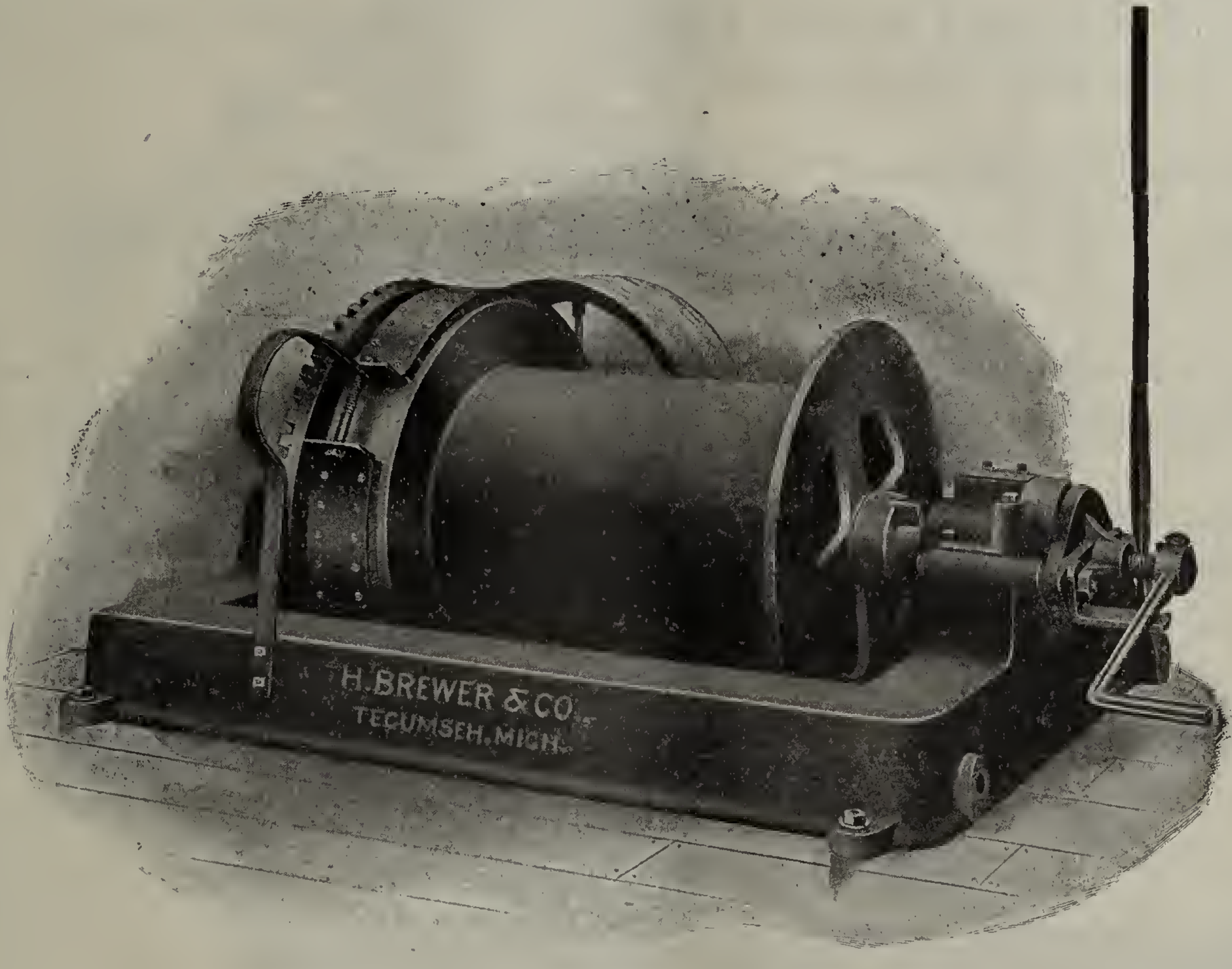
....

(Cross out the items not wanted, fill in and mail us the coupon.)

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

HOISTS

You can buy a Brewer Hoist without buying trouble with it. It will keep on hoisting without any coaxing. We have spur-geared hoists, bevel-geared hoists, spur-friction hoists and bevel-friction hoists. Large ones and small ones and all of them **good.**



This is a Heavy Bevel=Geared Pattern

It is No. 28. It weighs 3,000 pounds. The drum is 20 in. diameter, 28 in. between flanges and the flanges are 30 in. diameter. The journals are self-oiling, the gears 4 in. face, the brake band 5 in. wide. Can be made right or left hand. Illustration above is left hand. It is enough of a hoist for the biggest plants, and we have smaller ones for the others.

If you ask for our catalog you will get it

H. BREWER & COMPANY, Tecumseh, Mich.

**HERE IS
A
KILN
THAT WILL
DO AWAY
WITH
YOUR
KILN LOSSES**

The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

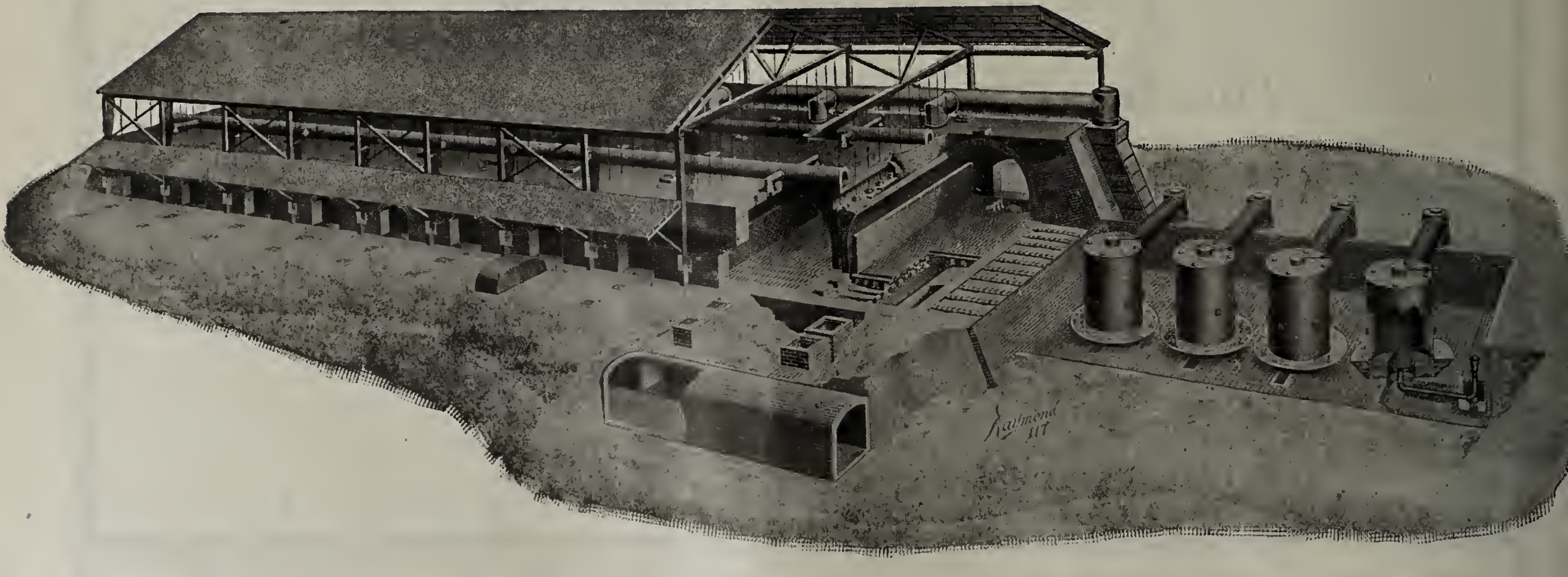
That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

International Clay Machinery Co.

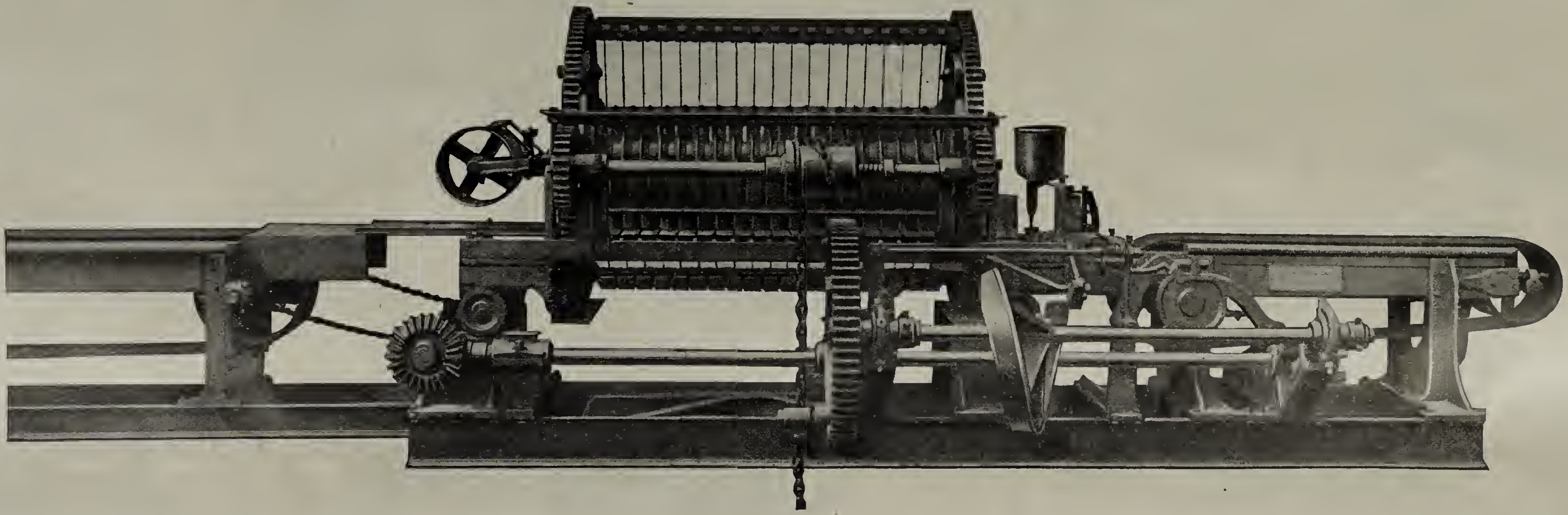
Dayton, Ohio, U. S. A.



The Producer Gas Fired Continuous Kiln

Steele's New No. 18 Automatic Side Cutter

Capacity 15,000 brick per hour. **Weight 6,000 lbs.**



The power is applied to the reel so as to offer no resistance to the carriage. In fact, it helps start it moving.

The reel is driven by crank motion, which gradually starts and stops it, eliminating shocks and jars.

The back platens are fitted with spring jaws, to prevent breakage of wires.

The best wire suspension known, making possible effective wire cleaners.

This cutter solves a hard problem in the most effective way yet attained, especially in very large capacities.

Investigate.

J. C. STEELE & SONS, **Statesville, N. C.**

Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

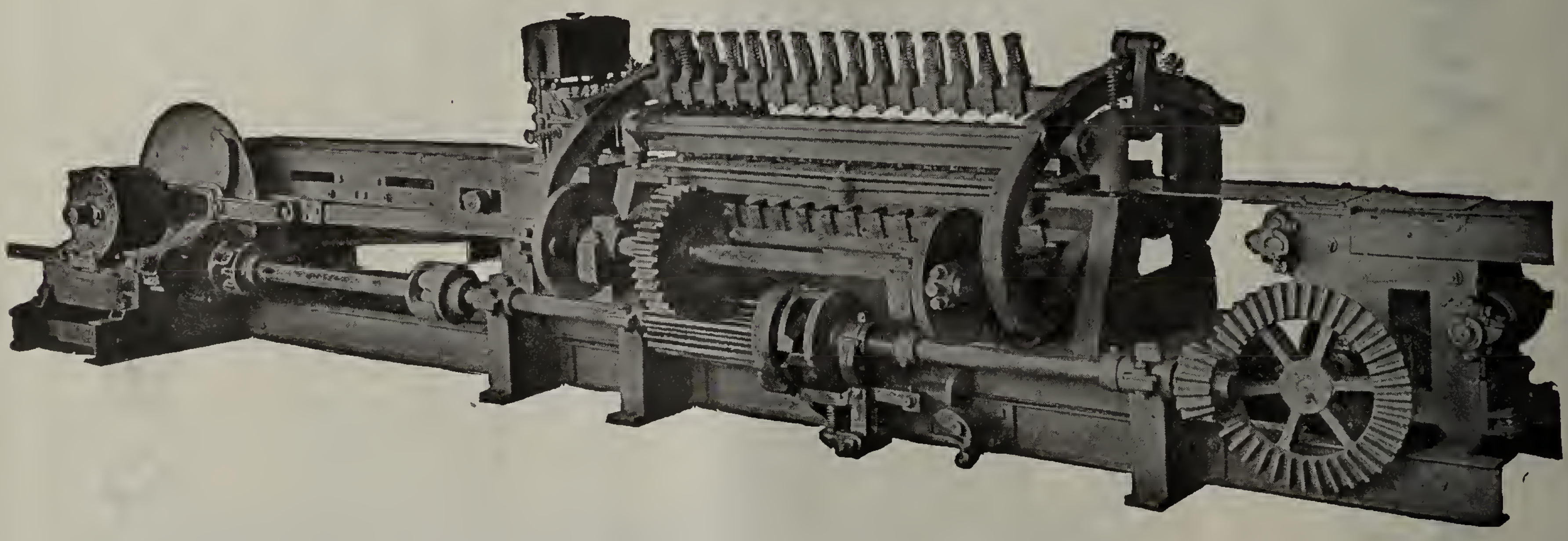
NON-SKID

A slipping automatic cutter—one that cuts crooked, misses cuts, or occasionally runs wild—is an expensive proposition.

That's why we believe in positive non-skid mechanism—the kind we have used for seventeen years.

It's simple, durable, understandable—and it's sure-acting.

If you've had experience with slipping automatic cutters you will readily realize the value of the positive never-miss mechanism of the Freese Automatic Cutter.



Model T 60 Reciprocating Automatic Cutter

Equally efficient in cutting repressed or Dunn Wire-Cut-Lug pavers, fire brick and builders.

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For
Sixty-Three
Years
The Name

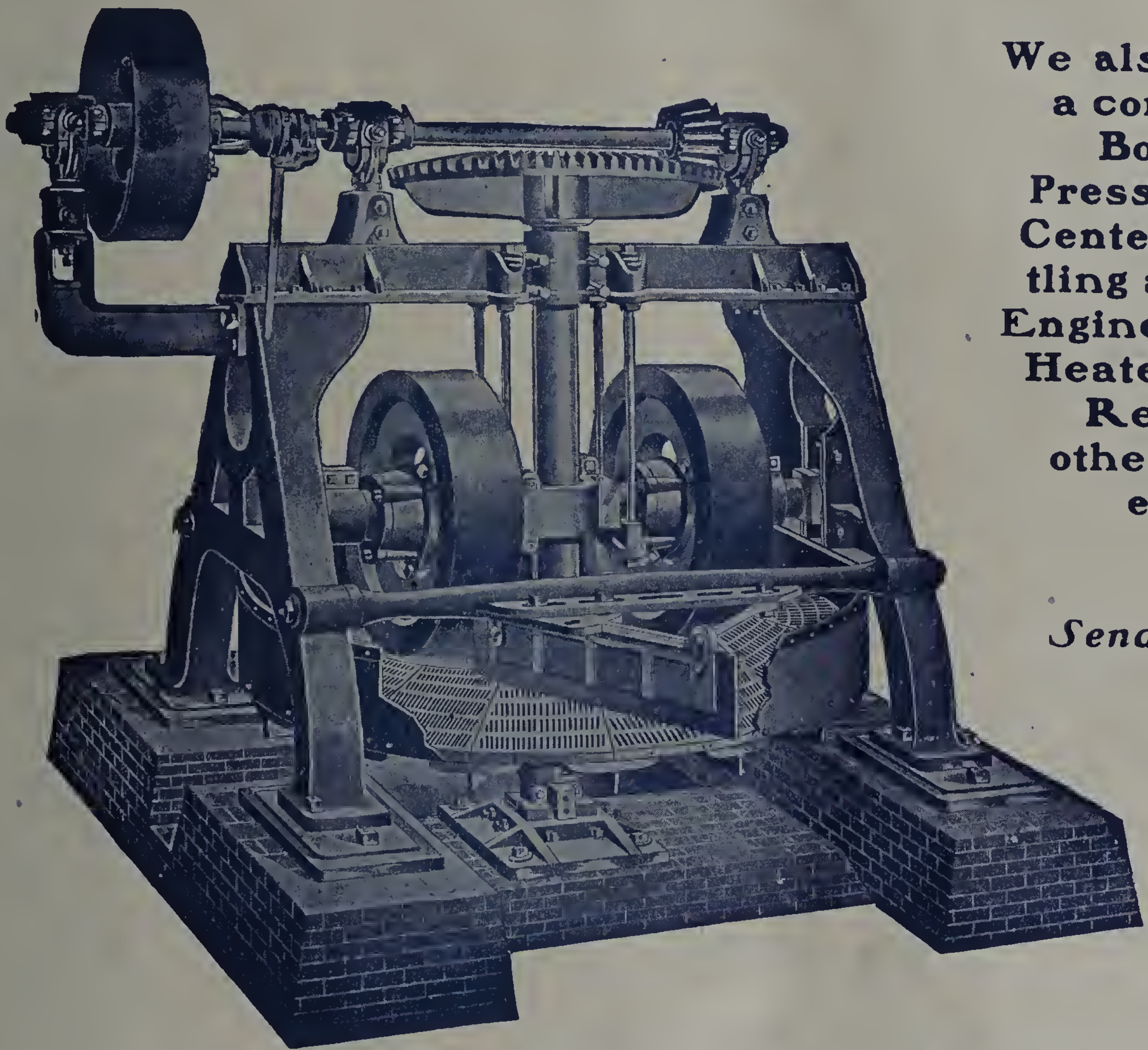
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.

The Wise Man of FATE

This Auger

Will Make 50,000 Brick or 25,000 4-in. Tile Daily

Here is the best single duty brick and tile machine ever made. It is built along the lines of the Fate "Special Imperial Machine," but provided with a large, roomy hopper, the pug mill being eliminated, making a fast working single machine where a combined machine and pug mill is not desired.

The Fate "H" Special

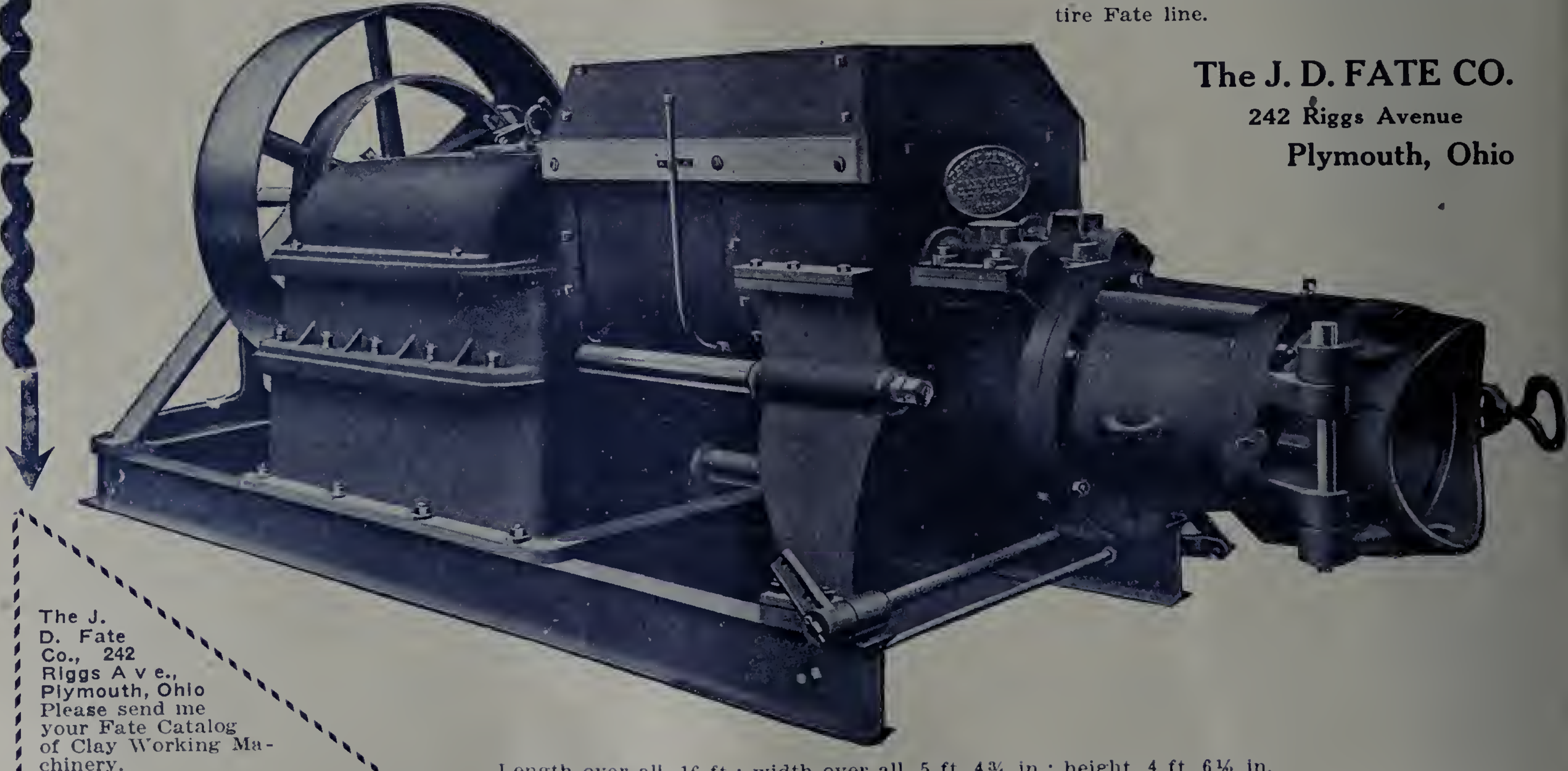
Is the Best Single Duty Auger Machine Made

It has the regular Fate double feeder shaft arrangement, large heavy shafting throughout, with main auger shaft 4⅜ inches in diameter and the pulley shaft 3⅞ inches in diameter. The friction clutch pulley is of the latest improved pattern and will run from 120 to 140 revolutions per minute.

GET CATALOG

Send for the Fate Catalog of Clayworking Machinery. It contains a full description of the Fate "H" Special and the entire Fate line.

The J. D. FATE CO.
242 Riggs Avenue
Plymouth, Ohio



Length over all, 16 ft.; width over all, 5 ft. 4¾ in.; height, 4 ft. 6½ in. Approximate weight, 12,000 lbs. Capacity, 30,000 to 50,000 standard brick per day or 15,000 to 25,000 four-inch tile; other sizes in proportion.

The J. D. Fate Co., 242 Riggs Ave., Plymouth, Ohio
Please send me your Fate Catalog of Clay Working Machinery.
Name........................
Address........................

This Free Book

Tells How---

The Lincoln Clay Products Co.

Does More Work With Two Gasoline Locomotives Than is Possible With 16 Men and 16 Mules, and Saves Four-Fifths in its Haulage Costs on Raw Clay.

The Wise Man of FATE

It is a most valuable book for any clayworker. It tells you how the Lincoln Clay Products Co. made this wonderful saving in the haulage system and gives definite cost data and other information.

In addition to this it gives complete cost data on 35 other installations, with full page photographic illustrations, telling how each owner cuts down haulage costs by supplanting mules, horses, steam hoists, electric motors, steam dinkies and other makes of gasoline locomotives. Further, this book tells you how—

The Plymouth

Gasoline Industrial Locomotive

Will Cut Your Haulage Cost in Two

It takes up the subject of haulage in clay plants and digs down deep into the vitals of the problem. There are no idle statements—no visionary claims—just a compilation of facts and figures for business men to use as comparisons.

This Book Proves These Six Points:

1. The Plymouth Locomotive is Cheapest to Buy.
2. The Plymouth Locomotive is Cheapest to Install.
3. The Plymouth Locomotive is Cheapest to Operate.
4. The Plymouth Locomotive is Cheapest to Maintain.
5. The Plymouth Locomotive Has Greater Draw-Bar Pull.
6. The Plymouth Locomotive Has Greater Traction Pull.

Every Clayworker Should Have This Book

It is for the small plant owner as well as the large plant owner and no matter whether you are contemplating remodeling your haulage system or not, you should have this book for the information it gives you on one of the most vital points in your business.

SEND FOR THIS BOOK

It's Free This book of ninety-six pages is for general distribution and as long as the edition lasts will be sent to everyone requesting it without charge or favor. There is a coupon for your convenience at the right.

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242 Riggs Avenue
PLYMOUTH, OHIO

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Gentlemen: Please send me without obligation on my part a copy of your big 96-Page Plymouth Book.
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(Firm Name)..........................
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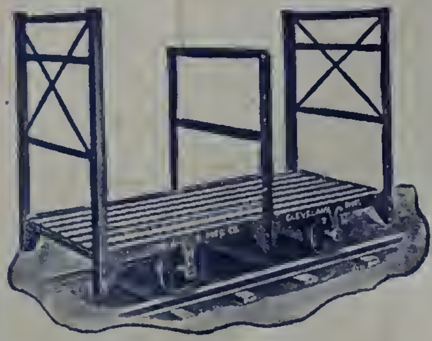
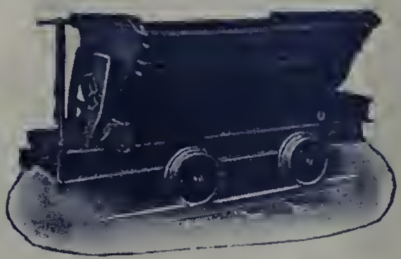


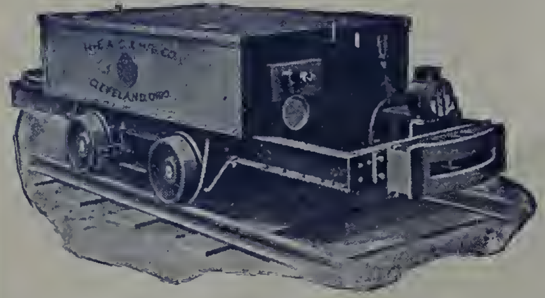
No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment



Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives



Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
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1189 Marquette Road, Cleveland, Ohio

BAIRD
POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

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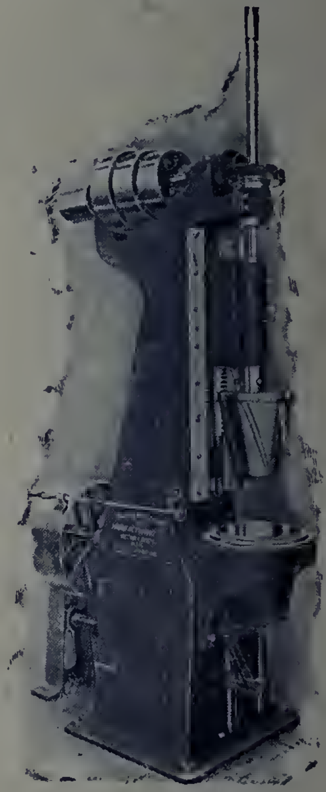

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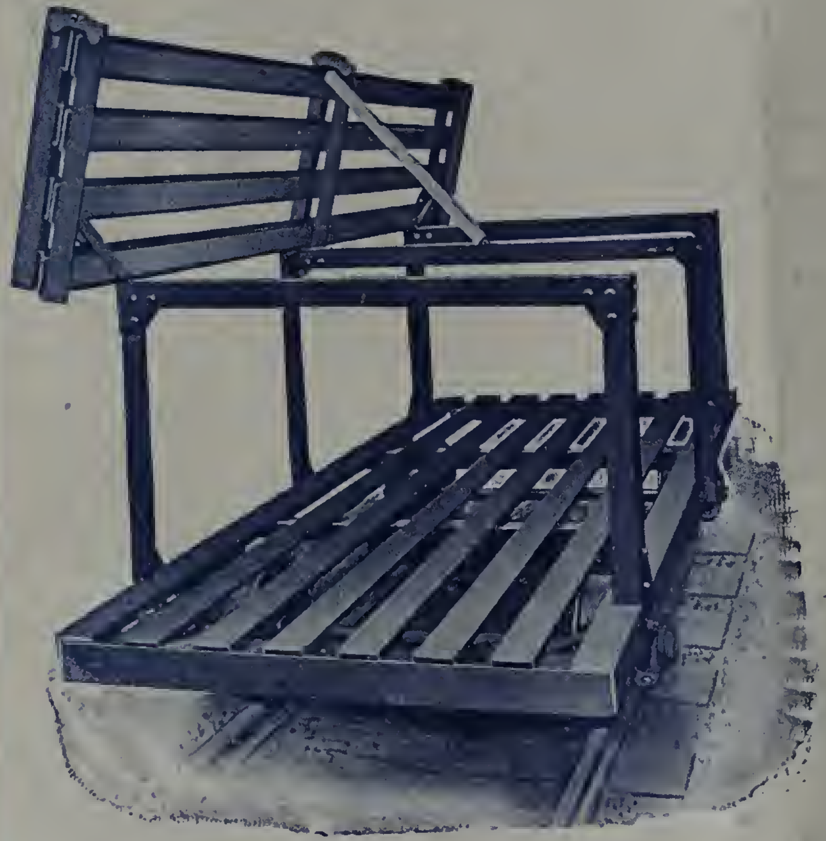
Machine & Mfg. Co.**
54-56 Jefferson Ave.
Detroit, Mich.



With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"

LAKEWOOD NO. 166

**Dryer Cars
Rack Cars
Dump Cars**

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

NEW YORK PHILADELPHIA PITTSBURGH
BALTIMORE CHICAGO

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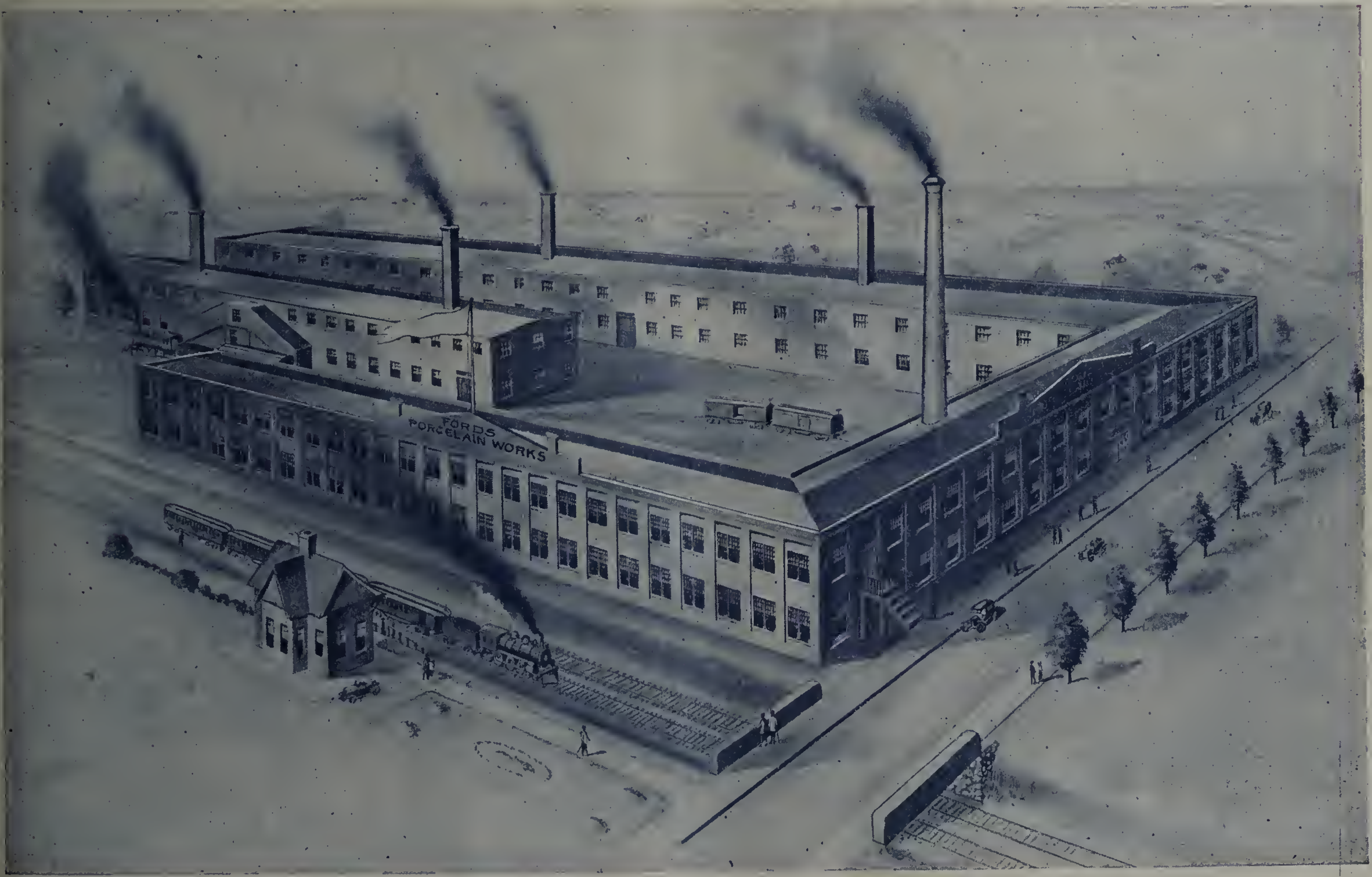
OCTOBER, 1916

THE CLAY-WORKER



A Great Clayworking Establishment: Plant No. 1 of the Fords Porcelain Works. See page 341.

Published Monthly by
T. A. RANDALL & CO.
INDIANAPOLIS, IND.
OFFICIAL ORGAN OF THE N.B.M.A.

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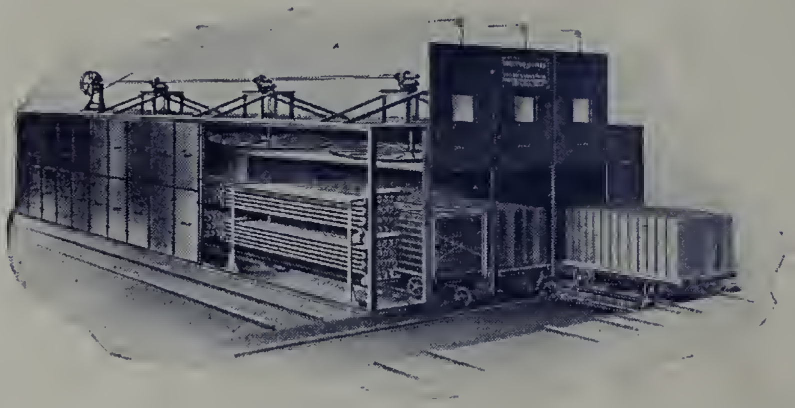
"Proctor" DRYERS

We respectfully invite you to
investigate the merits of

THE



"PROCTOR" DRYER for CLAY PRODUCTS

↓

To help you in your investigation we make the following statements of fact—not claims—

One brick plant now uses only 60 dryer cars whereas formerly they used 730, a saving of 670 cars and the space they took up.

In another plant the "PROCTOR" is safely drying nine duct conduit in 6 hours—former time 48 hours.

4-in. drain tile in 60 minutes.

Standard plastic fire clay brick in 12 hours—former time 48 hours.

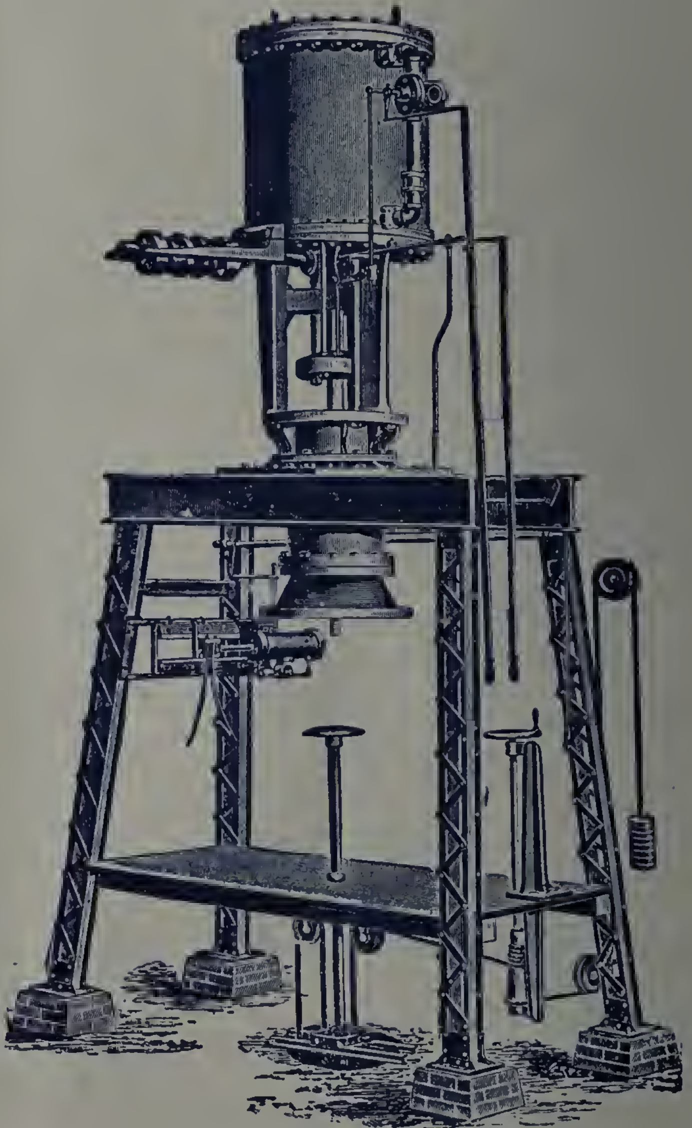
You owe it to yourself to investigate this wonderful dryer that cuts down the cost and difficulty of drying.

Start your investigation now—write us.

The Philadelphia Textile Machinery Co.
Philadelphia, Pa.

IT TAKES THE BEST TO MAKE THE BEST.

You cannot get a piece of steel out of a piece of lead.



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W. S. Dickey Clay Mfg. Co.	Kansas City, Mo.
Wm. E. Dee Clay Mfg. Co	Chicago, Ill.
Denver Sewer Pipe Co	Denver, Colo.
Denny-Renton Clay & Coal Co	Seattle, Wash.
Los Angeles Pressed Brick Co.	Los Angeles, Cal.
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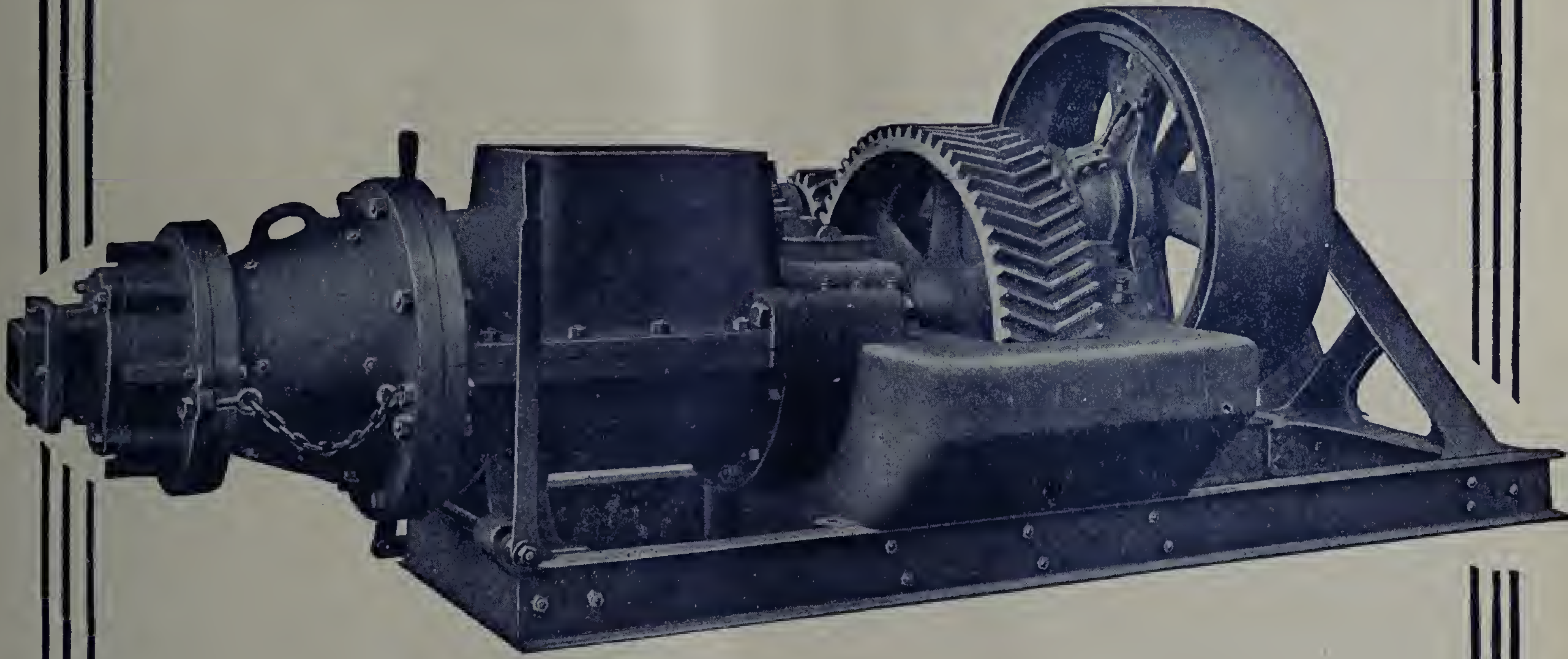
Robinson Clay Product Co	Akron, O.
Robinson-Graves Co	Uhrichsville, O.
Pomona Terra Cotta Co	Pomona, N. C.

and above 150 other of the largest clayworking concerns in important commercial centers of the United States.

The Taplin, Rice-Clerkin Co.

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



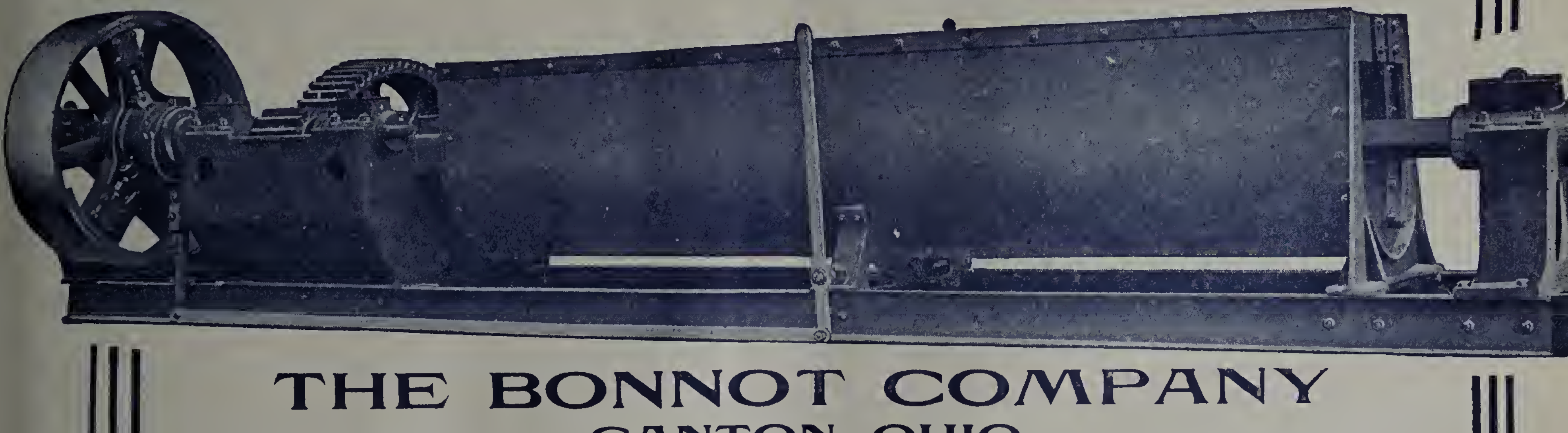
THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.



THE BONNOT COMPANY

CANTON, OHIO

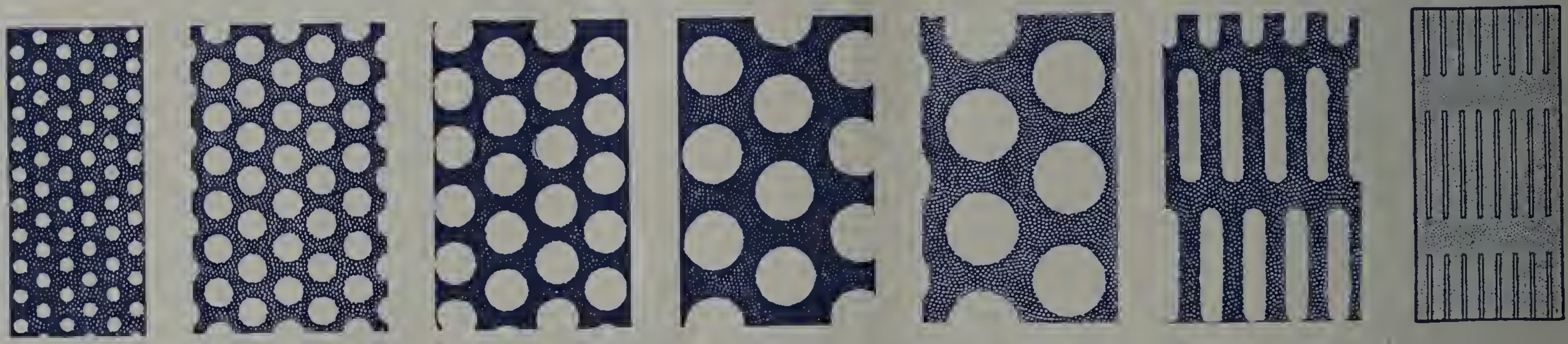
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

"No Wheelers Wanted" at this Plant for Loading Cars.

The rush season has no terrors for the Cuyahoga Brick & Shale Co. (Cleveland, Ohio.) The photograph at the left shows how they have beaten the "wheeling" game with a system of Mathews Gravity Brick Conveyers. A steady stream of brick flows steadily from kilns into cars in any kind of weather and with any kind of help.

This method enables you to roll your brick by gravity on a slight down grade, with no waste of time or labor to pay for, no damaged brick to discard, no expensive pay roll to take care of, and no fear of not being able to get your brick loaded promptly at all times.

Many large brick manufacturers have become users of the Mathews system this year. Hundreds of others have employed the gravity method for many years and could not be induced to discard it for any other method. We can supply prospective purchasers with plenty of references if desired.

Made entirely of steel, equipped with ball bearing rollers, assembled in portable units fitted with universal couplings. Curves of any desired angle can be supplied to deliver the brick to any required destination. Will last for years with very little upkeep expense.

Our representative will visit your plant, lay out a system to fit your requirements, tell you what it will cost, and take your order, all without extra cost. This service will not obligate you to buy if our proposition does not prove attractive. We can send you literature, but valuable time will be saved by requesting representative to call.

MATHEWS GRAVITY CARRIER CO.

Branch Factories:
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ELLWOOD CITY, PA.

RODGERS

FOR DRYERS

FROM STREATOR, ILLINOIS

(From Manufacturers of the Famous Shale-Tex Face Brick.)

February 17, 1916.

L. E. Rodgers Engineering Co.,
Zanesville, Ohio:

Gentlemen—We have had your Waste Heat Drying System operating in our plant now for almost one year, and think you will be interested to learn what we think of it.

Owing to the fact that we did not keep a total cost account of our previous drying expense, we can merely say that between the drying and the burning we figure that we have saved about 50c per M. This saving will be reduced by the electric current bill amounting to about 14c per M, which, outside of interest and depreciation, is the total cost of operating our dryer that we have discovered to date. The saving in burning is due to the fact that we now set thoroughly dried ware and thus reduce the time of water smoking.

The greatest saving, however, has come from the methodical operation of the plant, which is not dependent on the weather or other external conditions, and the increased output which we get from the same kiln capacity, due to decreased time of burning and handling.

The low power consumed to dry our brick (28 h. p. for 65,000 brick in 24 hours) is very gratifying to us and is due to your carefully designed flues and selection of the proper equipment. We should be glad to tell any prospective customer of our satisfactory relations with you.

Yours very truly,
STREATOR BRICK COMPANY,
(Signed) E. F. PLUMB, Vice-President.

L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
Brick Works Engineers

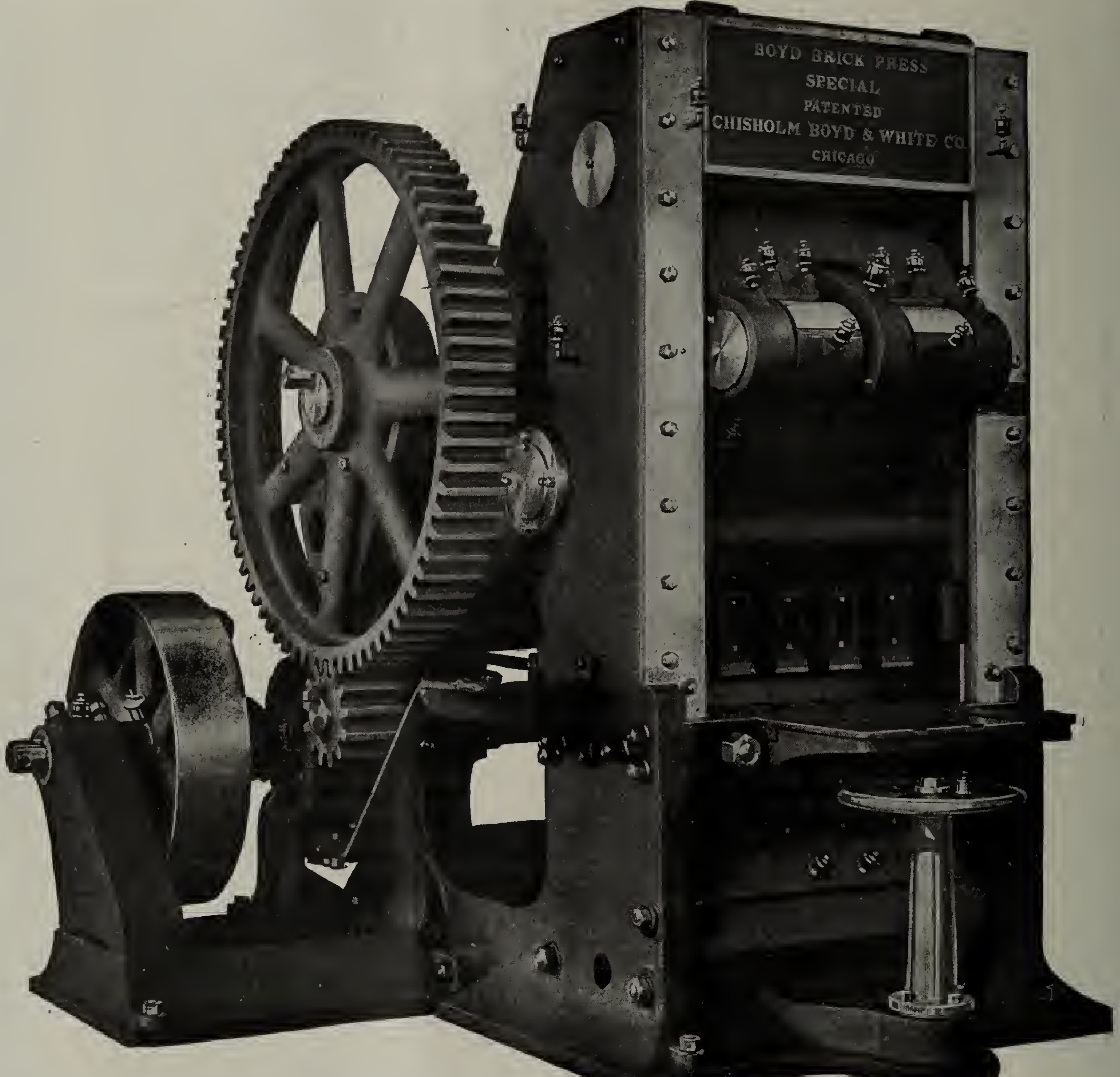
Largest Manufacturers of Brick Drying Equipment in the United States

General Offices ZANESVILLE, OHIO

RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

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Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.

(See Scrapers.)

Clay Steamers.

American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.

American Clay Machinery Co.
Fate Co., The J. D.
Hoehne, Richard B.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.

(See Supplies.)

Coloring Materials.

Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.

Orton, Edward, Jr.

Consulting Engineers.

Hoehne, Richard B.
Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.

American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.

Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.

Couplings.

(See Supplies.)

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American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Mueller Bros.
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Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

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Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
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Mittler Wire Mfg. Co.
Webb Wire Works.

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(See Supplies.)

Dies.

Louisville Machine Co., The
(See Supplies.)

Disintegrators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
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Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
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Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.

Ceramic Supply & Con. Co.

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(See Brick & Tile Machinery.)

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(See Supplies.)

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American Process Co.
Brick & Clay Engineering Co.
Boss Co., John C.
Chambers Bros. Co.
Crosby Dryer Company.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
National Dry Kiln Co.
Philadelphia Textile Mach. Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
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Chase Fdy. & Mfg. Co.
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Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
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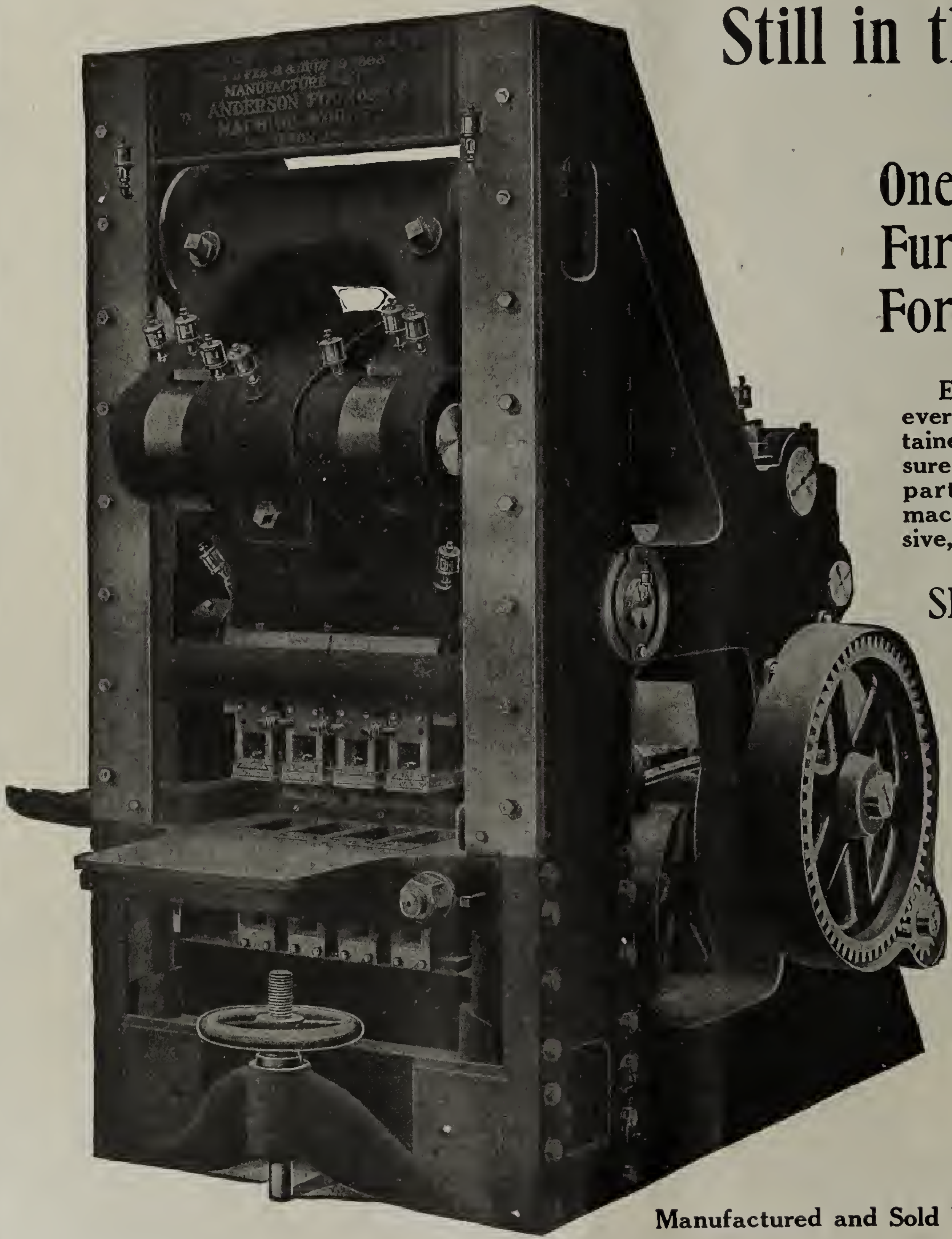

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Trautwein Dryer & Engr. Co.
Wilson, Thomas M.

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Brewer & Co., H.
Chambers Bros. Co.
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Freese & Co., E. M.
International Clay Mach. Co.
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Brown Instrument Co., The
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Thwing Instrument Co.

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Thew Automatic Shovel Co.

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Richardson-Lovejoy Engr. Co.

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Engineers.

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American Clay Machinery Co.
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Raymond Co., The C. W.

Gears.

(See Supplies.)

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Anderson Fdy. & Mach. Works.
Bonnot Co.. The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

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Mathews Gravity Carrier Co.
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American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
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(See Supplies.)

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(See Supplies.)

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(See Supplies.)

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Brewer Co., H.
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Lamb, J. & R.

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Mantel, Tile and Grate Monthly.

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(See Supplies.)

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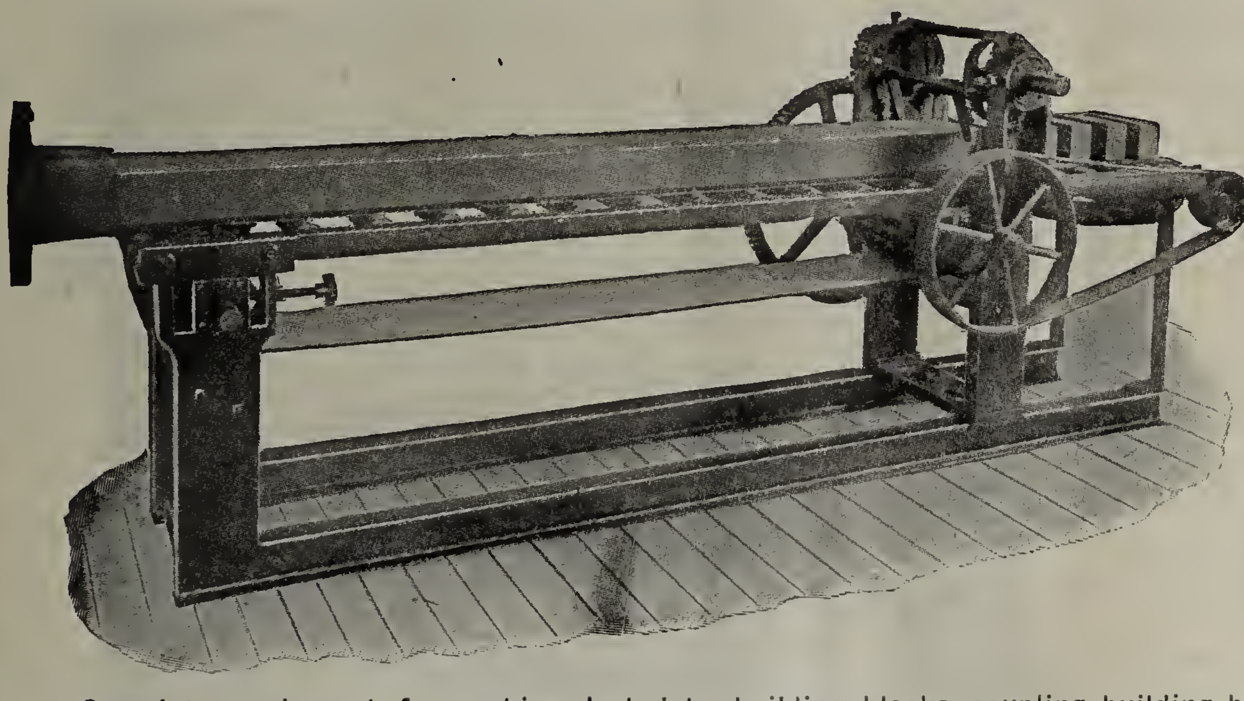

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Klose, A.
Manufacturers Equipment Co.
Ohio Kiln Co., The
Richardson, W. D.
Smith Co., Claude.
Swift, Edward A.
Yates, Alfred.

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(See Supplies.)

Kiln Bands.

Holliday, W. J. & Co.

Kiln Floor Tile.

Chicago Ret. & Fire Brick Co.

Knives.

(See Supplies.)

Locomotives.

Dewey Bros.
Fate Co., The J. D.

Manganese.

(See Coloring Materials.)

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American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

Mineral Paint.

(See Coloring Materials.)

Molds (Brick).

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Wallace Mfg. Co.

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(See Coloring Materials.)

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Fate Co., The J. D.

Oil Burners.

Schurs Oil Burner Co.

Paints.

(See Coloring Materials.)

Pallets.

Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).

(See Dry and Wet Pans.)

Paving Brick or Block.

(See Brick.)

Perforated Sheet Metal.

Caldwell & Sons, H. W.
Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

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Barrett Mfg. Co.

Plows.

(See Scrapers.)

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Schaffer Eng. & Equip. Co.

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Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.

Pottery Machinery.

American Clay Machinery Co.
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Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

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Trautwein Dryer & Engr. Co.

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Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
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Freese & Co., E. M.
International Clay Mach. Co.
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Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

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(See Supplies.)

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American Pulverizer Co.
Fate Co., The J. D.
Taplin-Rice-Clerkin Co.

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Ceramic Supply & Con. Co.
Dean Bros. Steam Pump Wks.
Potts & Co., C. & A.

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Beighlee Electric Co., The
Brown Instrument Co.
Ceramic Supply & Con. Co.
Rodgers Engr. Co., The L. E.
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Atlas Car & Mfg. Co.
Ceramic Supply & Con. Co.
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Hetherington & Berner.
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Thwing Instrument Co.

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Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Revolution Indicators.

Brown Instrument Co.
Ceramic Supply & Con. Co.

Revolving Steam Shovels.

American Clay Machinery Co.
Thew Automatic Shovel Co.

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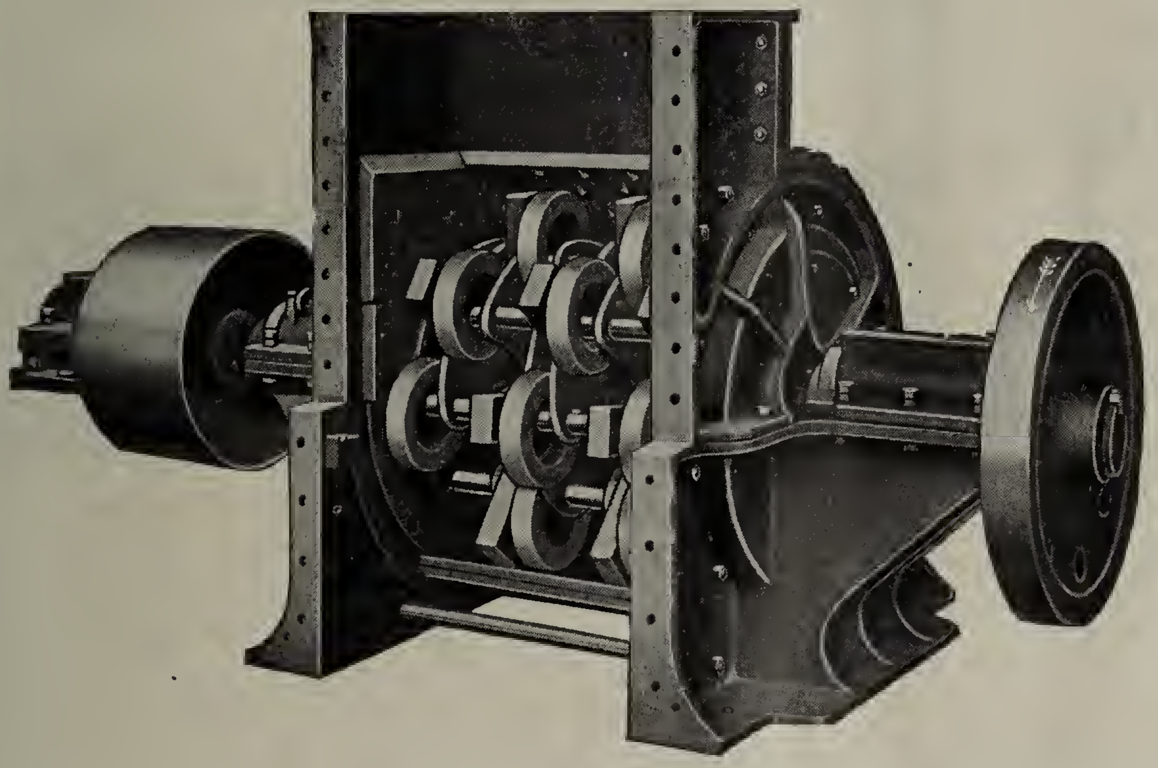

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American Clay Machinery Co.
Fate Co., The J. D.
International Clay Mach. Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Rope.

(See Supplies.)

Rotary Dryers.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Fate Co., The J. D.
International Clay Mach. Co.
Potts & Co., C. & A.

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American Clay Machinery Co.
Ceramic Supply & Con. Co.

Sand Lime Brick Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
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International Clay Mach. Co.
Lakewood Engineering Co.

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New Jersey State School.
New York State School.
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Arbuckle & Co.
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Eagle Iron Works.

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Brewer & Co., H.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Harrington & King Perf. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Taplin-Rice-Clerkin Co.

Sewer Pipe Machinery.

American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Taplin-Rice-Clerkin Co.

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Frost Mfg. Co.
Standard Dry Kiln Co.

Steam Traps.

American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

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Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.

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Anderson Fdy. & Mach. Works.
Atlas Car & Mfg. Co.
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Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons.
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Wallace Mfg. Co.

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Atlas Car & Mfg. Co.
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Ceramic Supply & Engr. Co.
Rodgers Engr. Co., The L. E.
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American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., H.
Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
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Brown Instrument Co.
Ceramic Supply & Engr. Co.
Thwing Instrument Co.

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(See Rails.)

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(See Supplies.)

Turn Tables.

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Fate Co., The J. D.

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Frost Mfg. Co.
International Clay Mach. Co.

Voltmeters.

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(See Supplies.)

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(See Pans.)

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626 Ohio Bldg.
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Drying Clay Wares

By Ellis Lovejoy.

Author of

Economies in Brickyard Construction and Operation.

Scumming and Efflorescence.

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It is the most valuable book of all our ceramic literature.

It is so terse and simple in its diction that it does not require a second reading to get the meaning.

The remarkable grasp of the author on this subject, his clear language, the detailed discussions and the arrangement of the subject matter make this book most interesting.

It is splendidly illustrated with sketches of the various types of dryers, etc.

The price is $2.00.

T. A. Randall & Co.
Publishers
Indianapolis, Ind.

"PAVE WITH BRICK" SIGNS FREE

Be a Booster for Brick Streets and Highways.
Send for signs to tack up where dependable pavements are needed.

National Paving Brick Manufacturers Association
Will P. Blair, Secretary, Engineers' Bldg. CLEVELAND, OHIO

SHAWMUT VITRIFIED PAVING BRICK WORKS

Shawmut, Pa. Alfred Yates, Gen. Mgr.

Vitrified Shale and Fire Clay Paving Brick and Blocks.
Burned in Yates' Patent Kiln.
Samples and prices on application.

ALTON BRICK COMPANY

Makers of High Quality Brick for
Roadways and Permanent Buildings.
Repressed and Wire-Cut-Lug Block.
ALTON, ILLINOIS

PAVING BUILDING • BRICK AND BLOCK • SIDEWALK FOUNDATION

The Barr Clay Co.

C. C. BARR, Pres., Streator, Ill.

The Danville Brick Company
Manufacturers of the Unsurpassed

Danville Paving Block

Danville, Ill.
LET US QUOTE YOU PRICES.

OXBLOOD RED FRONT BRICKS
DEVONSHIRES and REPRESSED

KUSHEQUA

Highly Vitrified by Natural Gas.
Tough Paving Blocks, Beautiful in Color and Finish.
KUSHEQUA BRICK CO., Kushequa, Pa.

McAVOY VITRIFIED BRICK COMPANY

PHILADELPHIA, PA.

"McAVOY BLOCK"

PROMENADE TILE

Chocolate Red
Highest Vitrification—Lowest Absorption.
BEST BY TEST.
KUSHEQUA KERAMIC COMPANY,
Kushequa, Pa.

Bessemer Limestone Company

Youngstown, Ohio
Manufacturers of Bessemer Block
The Most Uniform Shale Paver Made.

Tile Underdrainage.

By J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distribution among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

PAVE WITH BRICK

THE DEPENDABLE ROADWAY

MEDAL

The block with experience and service behind it. For 29 years the product of the present company has given satisfaction. We are the oldest paving brick manufacturers in Ohio west of the Ohio River.

MEDAL REPRESSED WIRE-CUT-LUG and HILLSIDE BLOCK.

The Medal Paving Brick Co.
Formerly The Deckman-Duty Brick Co.
1305-6-7-8 Sweetland Bldg., Cleveland, O.

"Best Paving Block Made"

Daily Capacity
500,000

The Metropolitan Paving Brick Co.
Canton, Ohio

SERVICE FIRST!

IRONSTONE BLOCK

OFTEN RATTLED BUT NEVER EMBARRASSED

A BLOCK OF THE IRONSTONE QUALITY IS ECONOMY

REPRESSED OR DUNN WIRE-CUT-LUG

Terre Haute Vitrified Brick Co.
TERRE HAUTE, IND.

Murphysboro Paving Brick Company

Manufacturers of

The Celebrated

EGYPTIAN PAVING BLOCK

The Block That Stands the Test.

Prices and samples furnished upon application.

MURPHYSBORO, ILL.

VITRIFIED PAVING BRICK

A valuable treatise on the manufacture and use of Paving Brick up to date. By H. A. Wheeler, E. M. Second edition.

Mailed to any address on receipt of $2.00.

T. A. Randall & Co. (Inc.) Publishers
Indianapolis

CLINTON PAVING BRICK CO.

Clinton, Indiana

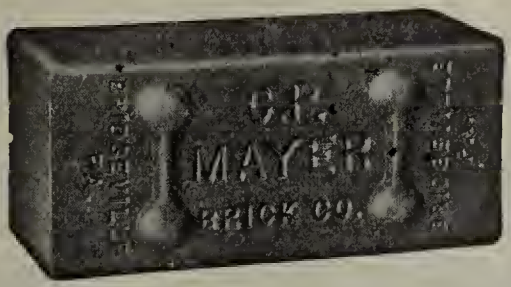
Are manufacturers of repressed vitrified shale paving brick of unquestioned merit and also licensees of DUNN'S Wire-Cut-Lug Block, which is the acme of perfection for street paving material.

Write us for samples and prices.

Clinton Paving Brick Company
Clinton, Indiana

C. P. MAYER BRICK CO.

BRIDGEVILLE, PA.



The Mayer Block is guaranteed to be free from all lamination, and the company will contract for delivery on a 20% abrasion test, or better, if necessary.

The Louisville Machine Co.

Louisville, Ohio

Dies for Clayworking our Specialty.

Brick, Fireproofing, plain and ornamental Hollow Ware Dies, for auger or steam press. Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

PATENTEES OF

THE ROLLER PROCESS PAVING BLOCK SYSTEM

PURINGTON PAVERS

ARE MADE OF

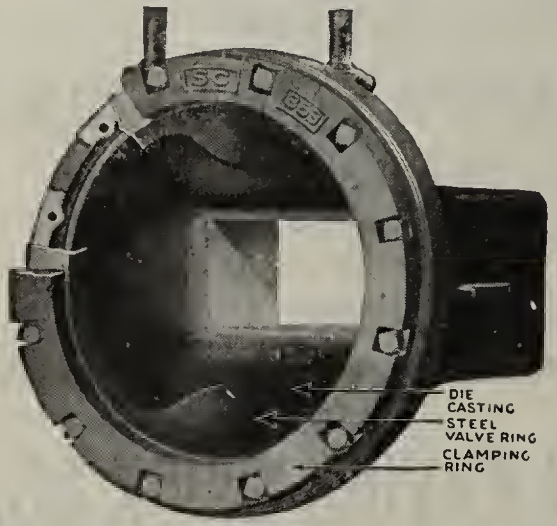
GALESBURG SHALE

PURINGTON PAVING BRICK CO.

GALESBURG, ILL.

Chambers Brothers Co., Philadelphia, Pa.

Brickmaking Machines and Appliances of the Better Kind.

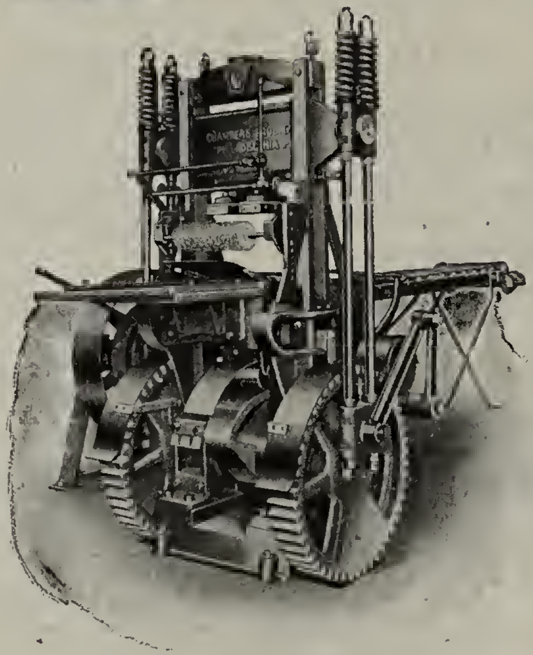


The Chambers Lubricating Die Helps on the Rattler Test.

The lubricant is applied at the point of greatest resistance and is forced into the die under pressure. Contributes to a more uniform movement of clay bar. Gritty shales and fire clays possessing but little plasticity are molded more succesfully with this die. Less power, less waste, better product. Used on various auger machines. Both side and end cut.

Lubricating Side-Cut Brick Die.

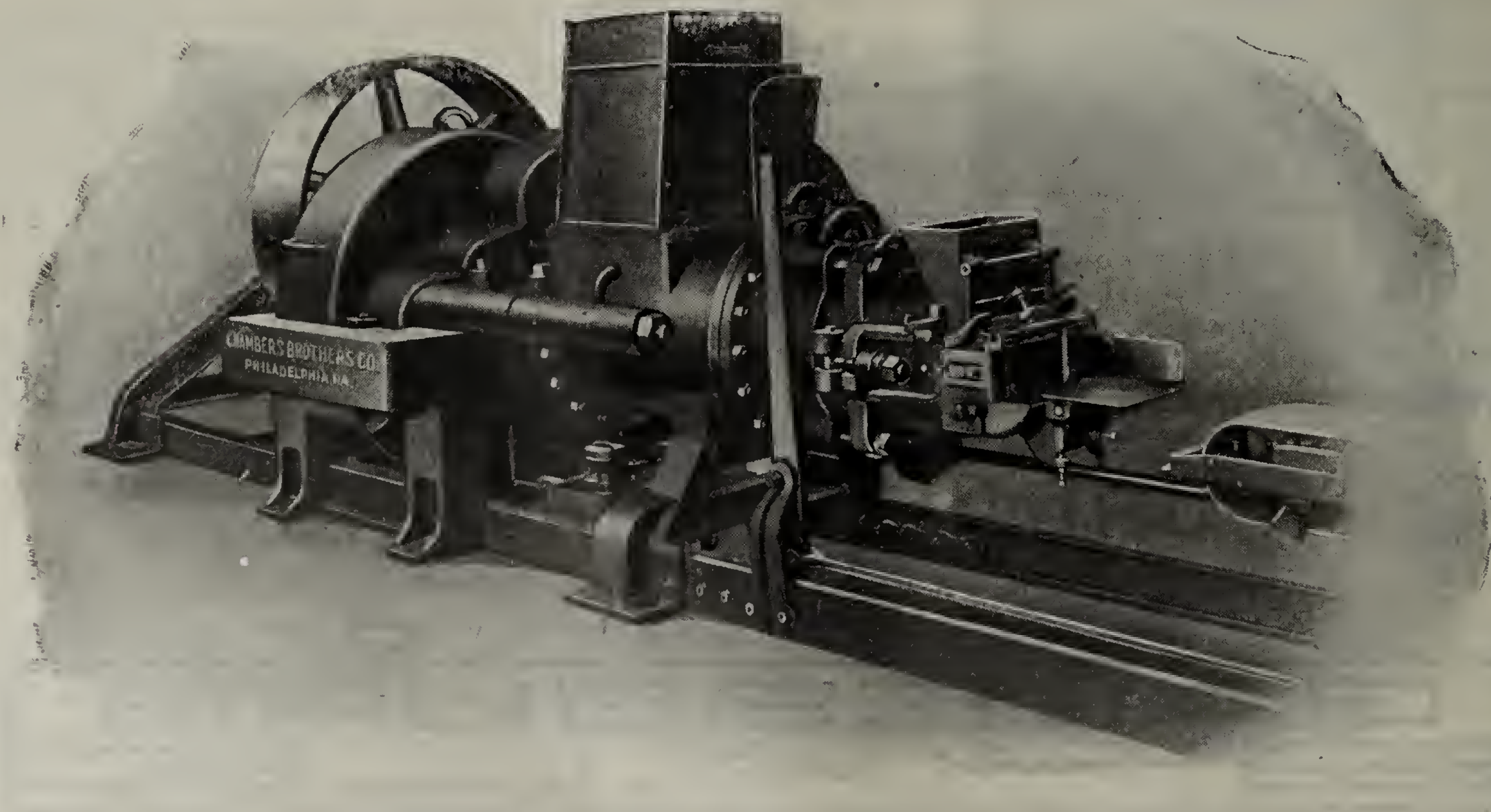
(Patented Feb. 24, 1903.)



THE KEYSTONE REPRESS

A strongly built Crank Press that has found favor with manufacturers of fire brick and furnace blocks. Closely built, with great stiffness in crank shaft.

All cross head slides of liberal dimensions. The feed mechanism is in perfect time and gives a smooth, easy movement to the finished product. Press built in four sizes for different classes of work.

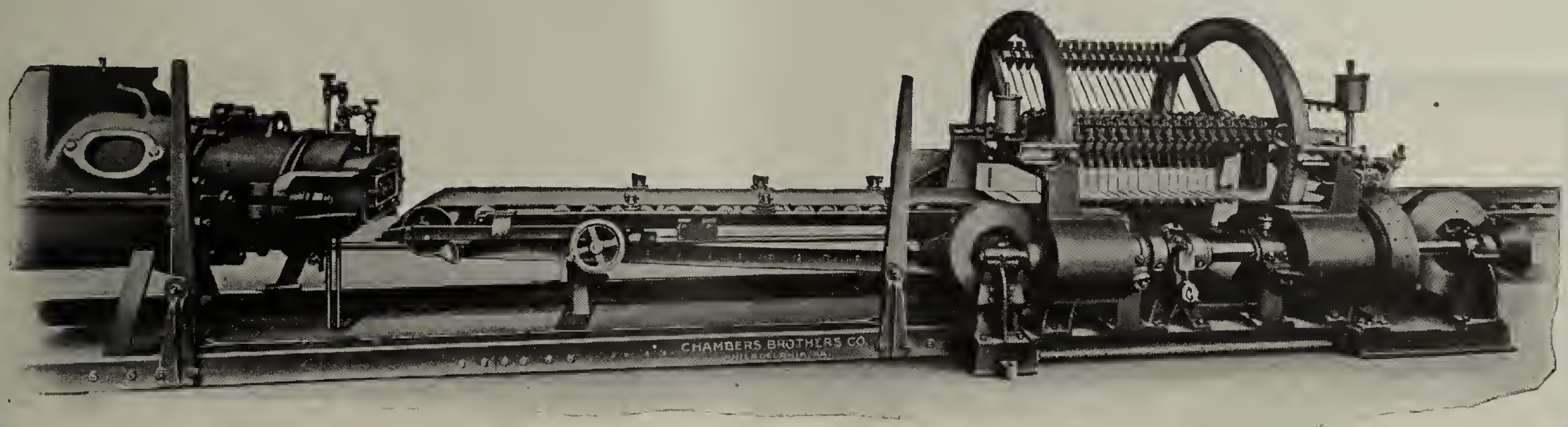


The Keystone Auger Machine---For End-Cut or Side-Cut Products.

Of great strength and large capacity. Single gear type. Gearing enclosed and running in oil. Journals lubricated by circulating oil system.

Chambers Brothers Co., Philadelphia, Pa.

Clayworking Machinery Developed
Through a Careful Consideration of the Criticisms of
Experienced Brick Manufacturers.



THE BRICK CUTTER THAT DOES NOT SWELL THE CLAY-BAR

Built so far as possible, to a standard for the construction of machinery of this class.

El Paso Brick Company

Pass-Tex Brick

By frost, nor flood, nor fire, nor even time are well burned clay products destroyed.

El Paso, Texas,
August 18, 1916.

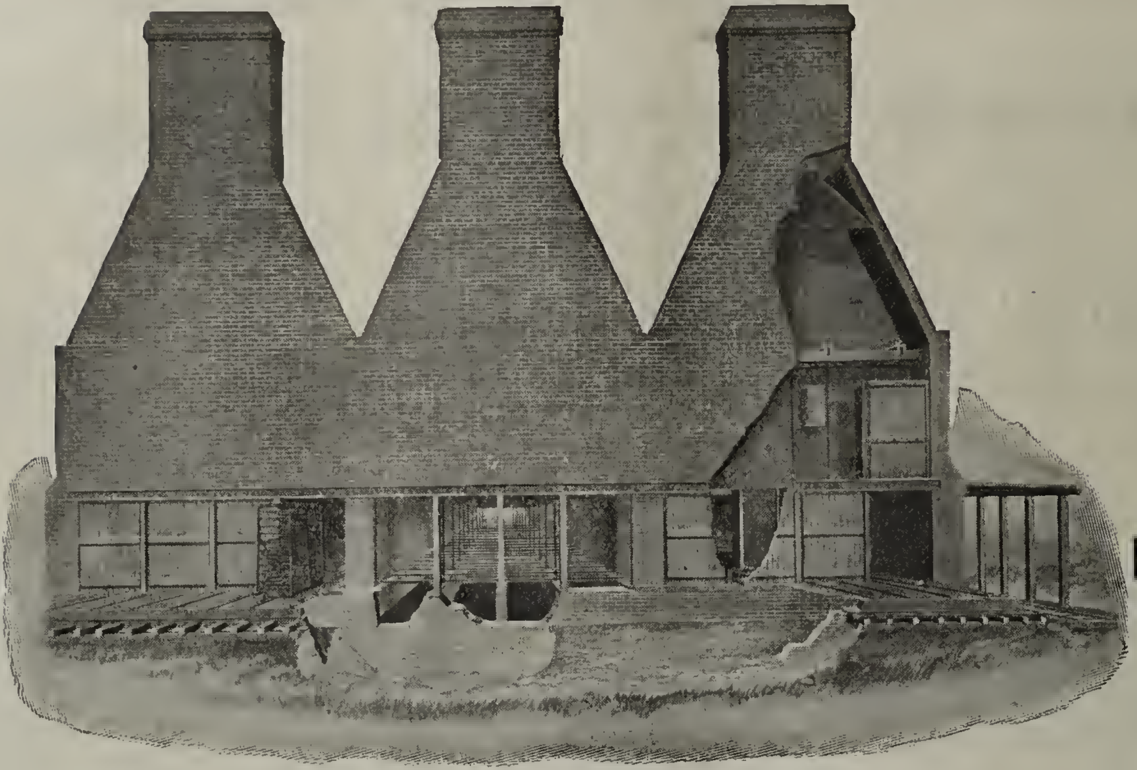
Chambers Brothers Co.,
Philadelphia, Pa.:

Gentlemen:

***We want to state that we are more than pleased with the way the Cutter has operated. We have given it a thorough test and find that it has more than made good on every claim made for it, and would be pleased to have you refer any prospective purchaser to us, regarding its merits.

Yours very truly,
EL PASO BRICK CO.
(Signed) E. Hewitt Rodgers, Sec'y.

Chambers Multiple Brick Cutter No. 10



The Standard Brick Drier

is always sold with a specific guaranty covering the results it is expected to produce.

Under these stern conditions it has been making good, on all varieties of clays, for 30 years.

If you are thinking of making a change in your drying arrangements, write us and we will tell you exactly what we will guarantee The Standard Drier to do in *your* case.

Securing this information will not put you under the slightest obligation to buy. Address: The Standard Dry Kiln Co., 1547 McCarty St., Indianapolis, Ind.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXVI. INDIANAPOLIS, IND., OCTOBER, 1916. No. 4

Written for THE CLAY-WORKER.

RED LETTER DAYS FOR PAVING BRICK.

Terre Haute, Ind., and Paris, Ill., Join Hands in Entertaining the Paving Brick Fraternity, October 5 and 6.

THE THIRTEENTH annual meeting of the National Paving Brick Manufacturers' Association was held at Terre Haute, Ind., and Paris, Ill., October 5 and 6, respectively, under the most favorable circumstances. The weather was ideal, the attendance large, the sight-seeing trips most interesting and instructive, and every detail of the crowded two days program was carefully attended to by the local and Paris, Ill., committees, which extended a warm hospitality. The ideal weather, the ideal make-up of the delegations and the ideal demonstration made up an ideal occasion long to be remembered by those in attendance, when the ideal paving material was shown in its real light.

Nearly 400 live wires were in attendance. It was a cosmopolitan body of men, representing various sections of the country, not only in the paving brick industry, but in various lines, chief of which were the engineering departments of a large number of cities. Men from the far distant states of California, Washington, Alabama, Oklahoma and New York were in attendance, making a careful study of the monolithic type of brick paving.

PAVING BRICK HIGHLY RECOMMENDED AS BEST PAVING MATERIAL.

"Eighteen years ago we were in the mud. We had money, but could not buy any road building material that would get us out of the mud and keep us out. Study, capital and your efforts have changed things, and we are anxious to extend our brick streets and highways so as to lessen the cost of our hauls and increase our automobile service and add to our pleasures as the years go by. In this community, where every yard of whatever kind of road building material we use must come by rail, the freight is gross extravagance on any material other than that material which will endure the longest, so it is economy to use paving brick. Our people are able to pay their bills and so demand the best for their money, and we believe we get this when we pave our streets and highways with brick."—From Mayor Hoff's Speech of Welcome.

College professors, engineers and men from distant points, including such as R. L. McCormick, professor at Rose Polytechnic Institute, Terre Haute, Ind.; S. V. Costello and O. W. Stoner, of the California Paving Brick Co.; J. P. Horgan, of the Board of Public Works, San Francisco, Cal.; Morris B. Greenough, of the Case School of Applied Science, Cleveland, Ohio; C. C. Benjamin, G. E. Martin, Purdue University, Lafayette, Ind.; John W. Sibley, of the Southern Paving Brick Mfrs. Assn., Birmingham, Ala.; Prof. Jas. I. Tucker, of the University of Oklahoma, Norman, Okla.; G. M. Harbert, Clarksburg, W. Va.; Jas. T. Voshell, of the Office of Public Roads, Washington, D. C.; Prof. Ira O. Baker, of the University of Illinois, Urbana, Ill.; Prof. T. R. Lawson, of Rensselaer Polytechnic Institute, Troy, N. Y.; L. R. Moran and E. E. Park, of the Park-Moran Co., Okmulgee, Okla.; E. E. Colby, Chickasha, Okla.; W. N. Logan, of the University of Indiana, Bloomington, Ind.; C. C. Wiley, H. H. Edwards, R. P. Brown, G. C. Fairclo, F. H. Newel, C. E., of the Road Dept., University of Illinois, Champaign, Ill.; Jno. J. Cox, Asst. Prof. C. E., Ann Arbor, Mich.; R. E. Levering, F. H. Eno, C. E. Sherman, H. S. Perry, O. S. U., Columbus, Ohio; S. W. Hume, New York, and Floyd W. Allen, Seattle, Wash.

The Terre Haute and Paris people joined hands in crowding the two days with active interest, so that they passed into history, long to be remembered. The program consisted of a business session, a banquet, trips about Terre Haute, visit to the plant of the Terre Haute Vitrified Paving Brick Co., and an excursion to Paris, Ill., where an actual demonstration of the correct monolithic brick paved country highways was being made, and a barbecue offered the hungry throng.

When the delegates began to arrive Wednesday evening they found the Deming Hotel, Terre Haute, Ind., the headquarters, decorated with welcome signs, American flags, red and white banners of the association, orange and white banners announcing the brick road construction day, Paris, Ill., October 6, a paving brick display and hundreds of flowers presented with the compliments of the Dunn Wire-Cut Lug Brick Company.

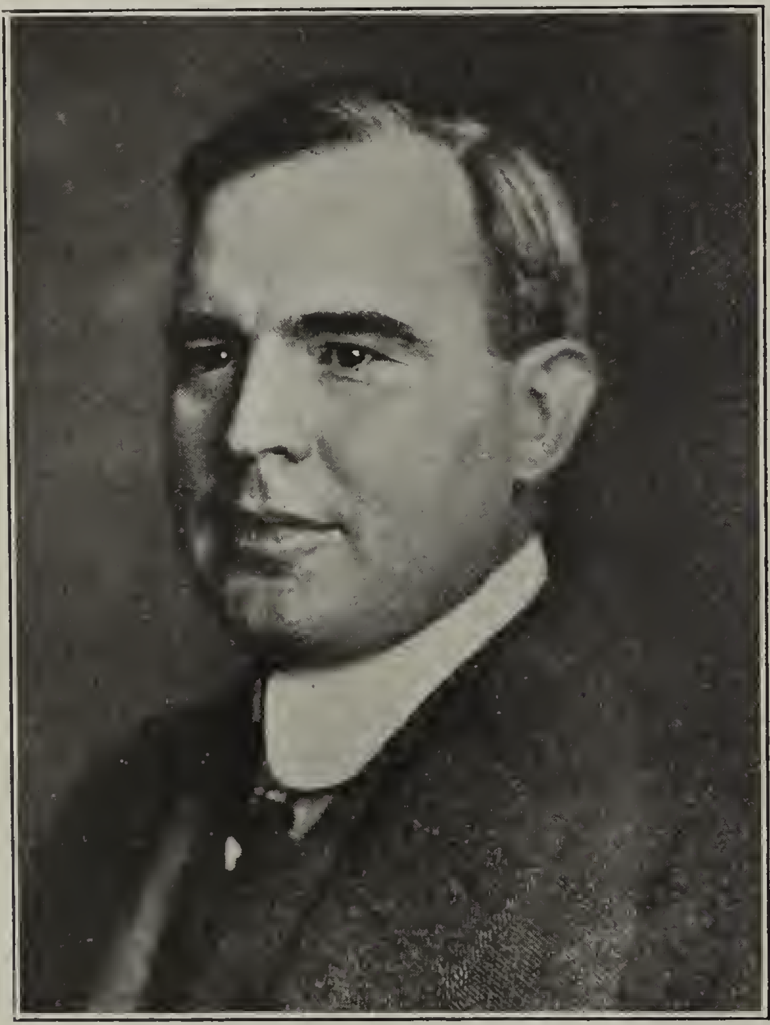
The furnishing of flowers is almost a copyrighted procedure of the Dunn Co., for whenever carnations are seen in conventions of the clay trade, it is a foregone conclusion that the Dunn Wire-Cut Lug Brick Company is on the job with a large delegation presenting posies and extending the glad hand. This year they made a departure from carnations and presented roses. This was due, no doubt, to the fact that at the last convention a certain fellow by the name of Jim had such an appetite for carnations that a doctor had difficulty in relieving him of his distressed condition. The roses, according to Jim, did not have the food value attributed to the carnations.

Business Session, October 5.

At ten o'clock Thursday morning, the delegates attended a business session. The meeting was opened by C. C. Blair, who immediately asked for a roll call. The reading of the minutes of the last meeting was dispensed with. Applications for membership were referred to the membership committee, after which the president read his address.

Address of President C. C. Blair.

Gentlemen—The year we are bringing to a close in our association work has been in many respects the most successful one we have ever enjoyed. Your secretary and assistant secretary will in their reports give full detail of the year's activity. Their modesty, however, has prevented them from taking full credit for all that has been accomplished.



President C. C. Blair, Youngstown, Ohio.

Dependable Highways, the little publication we started out with something over two years ago, with a circulation of three or four thousand per month, has passed the ten thousand mark, and is growing in power and influence much faster than in circulation. We do not believe there is anywhere a journal of similar character that can compare to it.

We feel that the membership should co-operate to the fullest extent, that Dependable Highways may be sent regularly to all persons of influence and all officials interested in highway improvement, so that opinions favorable to brick may be crystallized before some crisis arises that would make the effort too late.

In addition to the great mass of daily detail work, the office has most efficiently handled, under the direction of the technical investigation committee, a complete revision of all specifications.

This, you will readily appreciate, was a task of enormous proportions. The active officials and the office force are giving the association full value—they never lose a chance to get in a good word for brick pavements. No matter where you turn, you cannot help but be impressed with the unbounded enthusiasm and energy of our assistant secretary, and, more important still, the careful, conservative oversight of the secretary of the varied work of the association, assures to us the confidence of the public and the co-operation of civic influence so necessary to our interest.

The standing committees have been, and are now, faithfully performing their work. More good, we feel sure, could be accomplished by frequent meetings through the year, for the purpose of discussion of matters that come within their province, with a view of strengthening and stimulating the work of the association, as well as making such suggestions as they may deem of importance to the secretary. We would urge further, that, with the help of individual members, data of value to the association can and should be collected; we refer to pavements that have failed. Wherever you find them (and there are plenty of them) make a study and find the cause, report your finding, and we will soon have records that will be of great use to the industry.

Another thing of importance that has been entirely overlooked by the association, although some little progress has been made by kindred organizations, is the matter of uniform costs. The subject is too broad for discussion at this time, but we feel that a good, live committee should be put to work on this as soon as possible. If we could meet our neighbor and talk to him in terms and figures we could both understand, it would not be very long until brick would be sold at least above cost.

A Stretch of Brick Paved Highway Ready for the Grout Filler.

We want to thank every member and every person connected with the association for the hearty support they have given to the office committee and all the activities of the past year. It seems to us that the team work has been well-nigh perfect.

The faithful few who have so loyally supported the association from its inception with their money, time and advice, cannot help but feel gratified at the progress that has been made.

The unquestioned position that is occupied by the association reflects glory not only on its members, but also on the industry as a whole. There are a large number of manufacturers who are not supporting us; to them we appeal to come with us and help the cause.

We are doing all we can with the funds that are now available. There is much more to be done and it should be started at once. Think this over, Mr. Manufacturer who is without the fold. How would you like to see a national advertising campaign of such proportions as would compel the attention of every city and hamlet in this country? Other material associations with products of far less worth are pushing their material to the front in this manner. We can do it with your aid, and do it now. We are going to do it.

anyhow, whether you help or not, but it is going to take a long time, and you are going to get some more benefits that don't belong to you.

Are you going to stand idly by and let us bury you, or are you going to come along and enjoy the satisfaction of a work well done? Again we appeal to you—to your reasoning powers. Where would you be to-day without the influence of the association, competing with over one hundred different forms of pavements, many of which are extensively advertised and backed up by armies of promoters?

It is high time to stop arguments among ourselves and present a united front.

This address was followed by an interesting paper by Secretary Blair, on "Association Work."

Report of Secretary W. P. Blair.

We wish to express our deep sense of obligation to the inspiring support of the office board, whose advice was continually at our command during the past year, and to the faithful and loyal assistance of the entire office working force.

A Monolithic Brick Pavement.

We wish to strongly recommend to such members who have never spent a day in the offices of the National Paving Brick Manufacturers' Association that they do so at their earliest convenience, that they may know something of what is being done in behalf of the industry, entailing an incoming and outgoing mail totaling during the year 170,690, or a daily average of 558 pieces, aside from the special preparation of newspaper and magazine articles, lectures, technical and other papers, added to which is the make-up in words and pictures of Dependable Highways.

We wish to urge that the association take steps to insure the collection in 1917 of statistical data which will show the yardage of paving brick, as follows:

In what state?
For city or country road?
In cities of over 100,000 population.
In cities of over 25,000 and less than 100,000.
In cities of over 10,000 and less than 25,000.
In cities of less than 10,000.
Under what specifications laid?

Knowing where our markets are found in 1917 will assist very greatly in directing effective aim for increasing the same.

An appointment of committees of one member each to bring into this membership any acceptable sinner that is hanging on the outside.

A report of the activities of the association's work is one thing, but a report of the results is quite another thing. A report of judgment as to what ought to be done requires a measure of courage, not always entirely sufficient to prevent one from speaking lightly where harsh and disagreeable things would put into the picture more clearly the things that ought to be seen. Neither is judgment so easily exercised nor can one hope that all will coincide with what one may think to be for the best. Nevertheless, a report which shall encompass these things ought to be made which shall give to this membership some idea of the excuse for the existence of the organization.

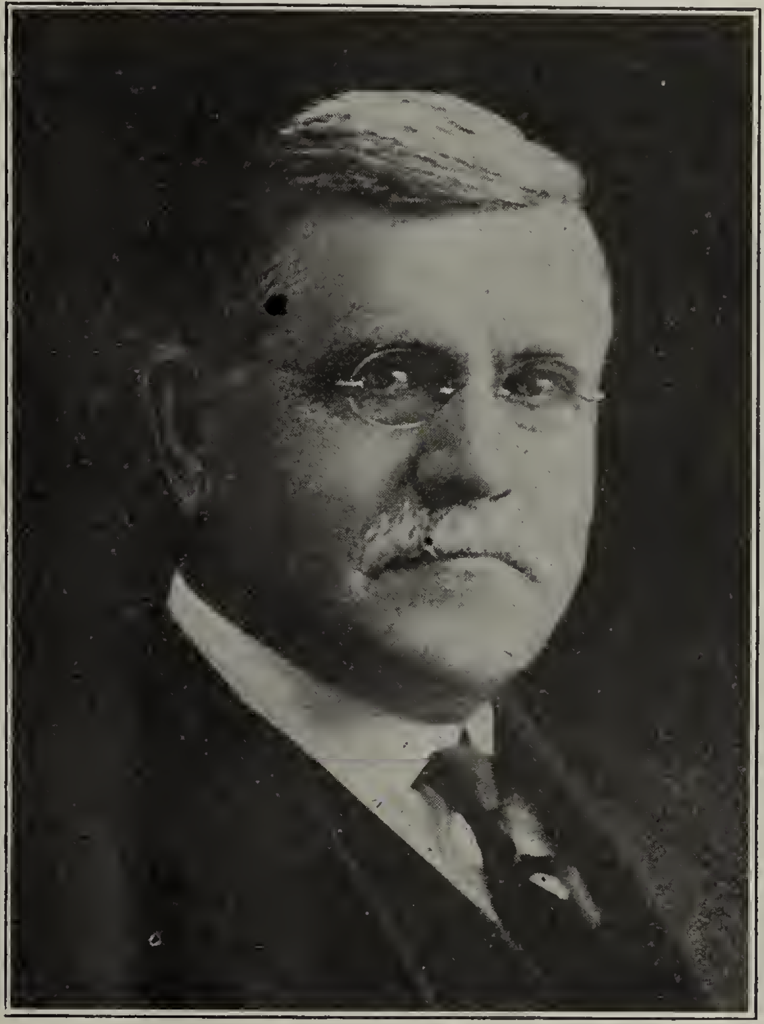
Evidence of our activity is found within the chambers of every state highway department in the country.

We pay a visit, in person or otherwise, to every city and town of sufficient size in the country to promise street improvement.

We go into the smaller communities, such as counties and townships, where the condition of the country road is being considered.

We go to these official headquarters continuously, for at such places new names appear at frequent periods.

We go to them as though they were fixed and stable, but by reason of the personnel undergoing a change from year to year, we must and do go repeatedly, telling them of our industry, of our product, and of the benefits that follow if they will but use it.



Secretary Will P. Blair, Cleveland, Ohio.

We tell them as best we can how to use the product to their greatest advantage. We are not only exercising directly, through officials, such persuasion to favor the use of brick, but we are constantly bringing to bear the leverage of civic and institutional organizations of every kind and character to further induce that favor. We do our utmost in the scramble of the single, isolated game.

These agencies through which we work are:
The Citizen Taxpayer,
The Town Council,
The Township Trustees,
The County Board,
The Fiscal Court,
Chambers of Commerce,
The Civic Club,
The College,
The Engineering Associations,
Welfare Clubs,
Political and Religious Organizations.

From Congress of the United States to the sewing circle of the little church around the corner; to the individual or to the organization. This energy and effort cannot be perfunctorily, mechanically or ignorantly performed. It must be precise and accurate. At the same time it must in each particular instance be directed to meet the particular requirements and necessities of the situation, which must be thoroughly understood or our work cannot attain success. To know thoroughly what supports existing sentiment and influences men as to their preferences is a prerequisite to turn them to our way of thinking. What would have accomplished favorable judgment for the use of brick a few years ago will not answer to-day

Conditions have changed.

Many recall the day when towns had no pavements at all and few kinds of paving material were upon the market. The effort then was to start an improvement, and if brick was the first in the field in that particular locality, it was not a difficult matter to persuade its use.

There are now a hundred or more road and street improvement materials pressing for a share of the vast amount of money that the people are putting up. The mad contest that is going on presents a condition that demands a closer file of our ranks, and, above all, a determined and steadfast purpose to march through the mob in a solid body. It is no time for jealousy or individual quarrel while the fight is raging. It is no time to lose one's head, become dazed or despondent.

"What's the matter?" should be answered by a quick and unerring response that will close up and protect our neglected and exposed points. However secure our many advantageous possessions, our energies should be directed toward a stronger fortification against attack.

What is our strongest inducement to persuade recruits to our side? Will any one say that it is not a splendidly built brick street, earning satisfaction, praise and pride on every hand?

Where lies our most vulnerable point in the great field where the contest is going on? Is it not the scene of a lost opportunity, where the brick street is one toward which you do not care to direct attention and which has brought about a condition that must be rehabilitated completely? To do so will require our best equipped centimeters, with the entire battery firing as a unit.

To rehabilitate a paving condition that is unsatisfactory, we are obliged to make promises for better conditions for the future.

Shall everything we do sustain those promises?

Shall wrongs be righted on the spot?

Shall timidity on the one hand or an over-awing attitude of the buyer withhold a rightful supervision where it should be exercised?

Or shall history repeat itself and make future conditions harder and harder, or shall our progress be made easier and easier?

I am assuming that men engaged in the manufacture of paving brick loyally believe the inherent worth of paving brick is unsurpassed; otherwise they are of but little use to themselves, an injury to the public, and should be out of the business.

This association during the past year has considered in a broad way the demands of this hour, and has prepared, through its technical investigating committee, in a most painstaking effort, specifications that will protect the interest of this industry if complied with. Have we the courage to see that this is done?

The engineers and the public are receiving these specifications with open arms. It is upon us to see that no taint of suspicion or doubt is laid upon these specifications by a failure to explicitly follow the details and thereby lay a new, heavy and unjust burden upon paving brick.

The manufacturers have, during the past year, supplemented the efforts of the National Association by organizing and placing in the field, under competent direction, field men who come into close contact with the authorities whose duty it is to provide directly for street and road improvement. These men will be able to break up the impositions of the vampires preying upon the public, and also meet manly competition when found. This we believe to be timely and necessary, and it ought to be supported by every manufacturer as every manufacturer ought to heartily support the National Association.

Constructing a Monolithic Brick Pavement Near Paris, Ill.

Such aid organization, together with Dependable Highways paying its visits to thousands every month, embraces a combination of effort that should, and I believe will, yield a return that will fully compensate for all it costs. Rather I should say it is a necessary and legitimate cost of producing and marketing which should in all cases be added to the selling price. In no instance should it ever be regarded as a donation.

The paving brick industry, stripped of the petty and vexatious trials that creep into every manufacturing enterprise, requiring exactions and unusual trouble characteristic of the past year, bears a relationship to present needs and necessities of the use of the material that augurs a bright future. The country is bound to find its road ultimatum in paving brick. The influence of national aid for highway construction, in the securing of which we take no small amount of pride, attaches an importance to road building which means a more dependable and durable road. A million or more automobiles demand the abolishment of the mudhole, and the great mass of farmer taxpayers is sensing the fact that the glide and the trot over a smooth road beats the pull and the tug.

Better times are ahead. The march to place where rations are to be distributed depends upon ourselves. A steady step, with a step altogether will get us there as surely as we speak these words.

The assistant secretary, Mr. H. H. Macdonald, presented a timely paper on the subject of "Publicity," which was as follows:

Report of Assistant Secretary H. H. MacDonald.

Gentlemen—We believe that this time and this gathering marks an epoch in the affairs of the association. The organization is in a prosperous condition financially. Success has attended our previous measures for brick highway promotion. There is every indication of greatly increased highway expenditures within the next few years.

We believe, therefore, that we can now commence definitely certain measures which have been discussed tentatively in the past. Our consideration of national advertising has developed a preference for a modest though dignified start in this direction at an early date. No doubt all are in accord with such a course, and we expect to see the publication of such advertising undertaken during the current fall and winter, in anticipation of 1917 contracts. As the results of this policy become apparent and certain outside manufacturers are led to see the further work the association is doing, we will be able to enlarge and develop our advertising policy to the proportions employed by some of our rivals.

As we have remarked before, our publicity measures in the past have been rather too exclusively aimed at the official and engineer without proportionately as great attention to the public at large. Without abandoning any of our previous efforts, we must reach the ordinary casual reader of current publications and actually brand his consciousness with the fact that brick paving actually solves the highway question. There is both an offensive and defensive necessity for this. The advertising pages of farm papers, of popular magazines and weeklies are becoming the market places of the modern world. People get their ideas of commercial progress from this source. Not to be represented in this display of the world's commodities is to invite the conclusion that we are a negligible or disappearing factor in the realm of highway improvements.

Time passes quickly, doesn't it, for it is hard to realize that Dependable Highways is now well along in its third year. The little magazine is gaining friends and influence with each succeeding issue. It voices paving brick in a consistent and steady manner, and never permits our material to be forgotten or not considered. One of the most valuable features of the magazine from a publicity standpoint is that it compels us to dig up good stories, which are acceptable even by the most influential engineering magazines in the country. These articles are, of course, offered with photographs to other magazines before they appear in Dependable Highways. By doing this we dispel any idea that we are trying to scoop anybody.

More assistance in securing advertising from collateral lines of trade, such as deal in trucks, steam shovels, machinery, contractors' supplies, etc., will be appreciated. When the manufacturers of these articles understand that the association stands behind its publication and learn it from association members who are their own customers, the advertising question will be solved.

The desire for increased revenue is dictated by a desire to make Dependable Highways a better publication. Although we have been fortunate enough to secure most valuable, interesting and convincing testimony from men in high positions, that deals incidentally with paving questions, so far we have paid nothing to them for their articles. Such reviews as those contributed by Major Bond, of the United States Army, Commissioner Bishop, of the Cleveland Health Department, and others, have a value far beyond the interested boosting that comes from within the brick fraternity itself. Words from these men bear an influence to many people that have a feeling of doubt toward anything coming from a man financially interested. Happily, however, this feeling is not entertained by a great majority of the people, who readily accept and recognize sincerity, even if it does come from the fountain head.

The association's success in the publishing field we attribute largely to a well-considered editorial policy which combines brief and popular treatment of themes with technical accuracy. The association's experience fits it to apply this policy to another field, not strictly in the realm of highways, but one in which more good for paving brick can be accomplished indirectly with an influential portion of the public than can be accomplished directly by an avowed brick journal.

In brief, we propose that the association consider the feasibility of standing sponsor for a farm periodical of modest dimensions, published with the same editorial, typographical and artistic care devoted to Dependable Highways, and that this periodical, while not obtruding its mission, be used to exert a continual pressure for brick roads and for the use of paving brick about farms in such structures as barn floors, feeding platforms, areas, silos, troughs and buildings.

While not essaying to produce a great and oracular authority on every phase of agriculture, we believe that we can turn out a journal which will be a welcome guest at every farmer's reading table. The great future field of highway construction is the rural field. Farmer sentiment with regard to materials and methods will largely rule. This sentiment is not easily created, or changed when it is created. Hence the continuous, quiet pressure that we could exert in such a journal would earn dividends far out of proportion to the enterprise necessary to keep it going.

This journal need not be an expense to the association. We have learned from Dependable Highways to trim our expenditures to our means and to expand as support expands. With an advertising field that embraces everything from needles to threshers, we are confident that this journal can be made self-supporting practically from the start.

While government aid for rural highways will soon be forthcoming and increasing attention should be given to the rural field, we do not urge the farm publication as an immediate step. We merely suggest its feasibility and advantage as soon as more pressing matters, such as the addition of new members and more revenue for national publicity, have received prior attention.

The question of increased support is vital to the general activi-

SNAPSHOTS OF PROMINENT MEN TAKEN DURING THE DEMONSTRATION.

ON LEFT—W. P. Blair and Z. T. Baum, Mayor of Paris when first brick pavement was laid, CENTER—R. D. Culver, who furnished the brick for the famous Indianapolis Speedway and Alan J. Parish, the contractor who built all the brick roads around Paris. ON RIGHT—John L. Rice, Secretary of the Akron Sewer Pipe Manufacturers' Association.

ties of the association. One source that has not been developed to its limit is that of associate memberships. The purpose of our associate memberships is to permit participation in association activities by manufacturers' representatives, machinery manufacturers and others, who have their own good reasons for desiring to see our efforts prosper.

In the opinion of your assistant secretary, perhaps too restricted a view has been taken of the province of this membership. It might be called to the attention not merely of brick dealers and salesmen, supply and equipment men, but any person or concern which has a direct interest in paved highways.

The broad nature of our recent propaganda entitles us to be regarded as something more than a mere trade association. Very few good roads organizations can point to actual accomplishments in solving the highway problem that we can boast. This is being recognized by an increasing circle of influential men who do not scruple to call themselves brick advocates. There are others, such as auto and tire manufacturers, who reckon their annual profits in direct proportion to the increased mileage of improved highways and who may be found willing to identify themselves with us. In fact, every one who wants good roads for sentimental or business reasons, and has no selfish bias toward rival materials, can be looked upon as good prospects in an associate membership campaign.

Jim Hoskins Takes the Water Cure.

In conclusion, let us urge a determined and progressive policy for this association. New ideas are stepping stones of progress. Some of the things we have suggested are new. Some of them have been debated before at these gatherings. A receptive attitude toward fresh lines of activity is indispensable in a living organization. Let us show the world the faith in our own product and in the greatness of America's economic future by daring to be original, to be forceful and to do big things.

The future of our industry and our association is what we make it. Our present prosperity will seem insignificant compared with what the next few years will bring forth, if we are alert to meet our opportunities and to let the world know that humanity can be effectively, economically and lastingly lifted out of the mud and out of everything that the mud means. It is a task of commercial statesmanship to which we are equal if we can, first of all, see it, and, secondly, each do his bit toward the whole result.

The report of the treasurer, C. C. Barr, of Streator, Ill., showed the usual splendid balance maintained by the association sufficient to care for any emergency.

Reports of various committees were made, followed by the reading of a letter from the Building Show officials, urging participation of the paving brick manufacturers in the show to be held in New York City next March. This matter was referred to the proper committee for consideration.

The election of directors for the ensuing year was made, with the following result:

J. B. Wilcox, Alliance, O.; Eb. Rodgers, Alton, Ill.; W. N. Alderman, Athens, O.; C. C. Barr, Streator, Ill.; C. C. Blair, Youngstown, O.; G. O. French, Canton, O.; R. C. Burton, Zanesville, O.; W. P. Blair, Cleveland, O.; J. W. Robb, Clinton, Ind.; C. J. Deckman, Cleveland, O.; J. G. Barbour, Canton, O.; F. L. Manning, Portsmouth, O.; J. L. Murphy, Nelsonville, O.; John Kline, Wickliffe, O.; R. A. Doan, Nelsonville, O.; G. E. Carlyle, Portsmouth, O.; J. R. Smunt, Cleveland, O.; C. P. Mayer, Bridgeville, Pa., and H. C. Adams, Danville, Ill.

The directors then elected the officers of the association, namely:

C. C. Blair, Youngstown, O., president.
J. W. Robb, Clinton, Ind., vice-president.
C. C. Barr, Streator, Ill., treasurer.
W. P. Blair, Cleveland, O., secretary.
H. H. Macdonald, Cleveland, O., assistant secretary.

The president then appointed the following committees:

Executive Committee—Eb. Rodgers, W. N. Alderman, C. P. Mayer, J. B. Wilcox, G. H. Francis, T. J. Armstrong, J. W. Robb.

Office Committee—C. C. Blair, C. J. Deckman, J. G. Barbour.

Committee on Specifications and Technical Investigation—W. P. Blair, S. M. Duty, Eb. Rodgers, J. G. Barbour, C. C. Blair, W. T. Blackburn.

The board of directors went into an informal business conference, in which matters of direct interest to the manufacturers were considered. It was long after noon when the convention adjourned, the delegates repairing to the dining room, where a hasty meal was eaten prior to an automobile trip to the Terre Haute Paving Brick Company's plant.

Delegates Visit Brick Plant.

A long line of automobiles belonging to the members of the Terre Haute Chamber of Commerce and the Automobile Club awaited the delegates just outside the main entrance to the hotel. The machines were decorated with the road construction day pennants and these, together with the hilarity of the delegates, attracted attention along the way to the plant managed by James Hoskins. "Jim" was the same, good humored fellow as usual and mixed a lot of fun in with the serious replies made to questions asked by the visitors.

"Marse" Sibley, Eben Rodgers and W. R. Barnhart Watching Preparation for the Barbecue.

The factory is a most interesting one in every detail, manufacturing sixty thousand Dunn wire-cut lug brick per day. A complete line of Bonnot clayworking machinery is used here, save for the E. M. Freese Company's automatic cutter, a patented device for cutting the lug brick. The plant was running like clockwork, four of five large dry pans were grinding up the raw material delivered on belt conveyors from the storage bins. The material was crushed in a crushing plant located near the shale pit before being hauled to the plant in heavy wooden side dump cars, drawn by a dummy locomotive.

The shale is a very hard shale and requires unusual preparation. To meet this requirement the company had to install this crushing plant, costing eighteen thousand dollars. The delegates were much interested in studying the shale deposit, watching the steam shovel and dummy engine at work, and witnessing the six men working as if their lives depended on it in the receiving portion of the crushing plant, where huge slabs of shale were pulled and yanked until they dropped into the jaw crusher below. There are many interesting features in this plant, but lack of space prevents our giving details concerning same at this time. The ware is burned in twenty-eight down draft kilns, ranging from 28 to 32 feet in diameter. The company is erecting two new kilns to care for their increased demand.

The Live Wires of the Dunn Wire-Cut Lug Brick Company.

The Hungry Delegates Partaking of the Savory Food at the Barbecue.

The return trip to the hotel was made late in the afternoon. That evening the delegates were free to entertain themselves in whatever manner they chose, some preferring buttonhole talks, some the gurgle of liquid refreshments, and others picture shows.

All were on hand bright and early Friday morning, so an early start was made of a full day's program. The brick streets of Terre Haute were inspected, dozens of automobiles being loaned by Terre Haute live wires. After an hour sightseeing, the delegates alighted near the interurban station and spent the time remaining before the scheduled departure for Paris, Ill., in inspecting a faulty wooden block pavement. It had rained the day before, so, naturally, the wooden block pavement had humped up in places, as is customary.

Mother Nature had painted the landscape with her brightest colors, so that the hour spent in traveling from Terre Haute to Paris, Ill., through a wooded section, was most delightful.

At Paris we were met by the Paris band and a throng of late arrivals. Mayor Huff made a short speech of welcome, in which he said:

Welcome of Hon. W. H. Hoff, Mayor of Paris, Ill.

Gentlemen of the National Paving Brick Manufacturers' Association:

As a representative of the city of Paris, in the rich county of Edgar, in the great state of Illinois, we are indeed glad of this opportunity to express our gratefulness for what you have done in adding the one thing that was needed to make us a happy as well as prosperous and successful agricultural community. We feel we owe a debt of gratitude to the paving brick manufacturers.

Eighteen years ago we were in the mud. We had money, but could not buy any road building material that would get us out of the mud and keep us out. Study, capital and your efforts have changed things, and we are anxious to extend our brick streets and highways so as to lessen the cost of our hauls and increase our automobile service and add to our pleasure as the years go by.

In this community, where every yard of whatever kind of road building material we use must come by rail, the freight is gross extravagance on any material other than that material which will endure the longest, so it is economy to use paving brick. Our people are able to pay their bills, and so, demand the best for their money, and we believe we get this when we pave our streets and highways with brick.

Today the city is yours, the highways are yours, and we

Studying the Mauufacture of Paving Brick.

UPPER PICTURE: Kiln Yard of the Terre Haute Vitrified Brick Co.

CENTER PICTURE: A Group of Delegates Including "Marse" John W. Sibley and Eben Rodgers near Hoskins Artesian Well.

LOWER PICTURE: View of the Shale Pit from the Track Leading to Top of Shale Crushing Plant.

are your humble servants to help you make this meeting of 1916 the most successful and profitable you have ever had."

The mayor explained to the writer that he meant every word that he said and that he was sorry he could not express his deep convictions in stronger terms. Brick pavements, properly constructed, have been important factors in the prosperity of this wealthy district.

The delegates boarded street cars furnished by the city of Paris and were taken to the point chosen for the demonstration on the country highway, adjacent to the city water works reservoir. This was not a staged demonstration, but a part of the actual contract for improvement of this road now being carried out by Contractor Allen J. Parrish, under the general supervision of Superintendent W. T. Blackburn. These two men have deserved note in the paving world for excellence and economy of the monolithic pavement laid in Edgar county in 1915. While the monolithic idea has been advocated repeatedly through several years, the credit for working out mechanical details and gaining deserved recognition for the merits of this kind of brick pavement undoubtedly belongs to these two men. Naturally, they shared largely in the joy and pride which this had brought to Paris and Edgar county.

The visitors saw not merely the demonstration of each step in the paving process; the laying of the concrete base, the operation of a double template which leveled the concrete and spread a dry mix of mortar; the rapid laying and grouting of the brick surface, but they witnessed a spectacle of structural efficiency that won the compliments of all and the envy of some. Contractor Parrish reported at the end of the day that he laid 800 yards of pavement in spite of the unavoidable interference of visitors, who pried into every detail of the work and fairly overrun the job. He also reported more than one offer to buy his equipment and organization, just as it stood.

At 1:00 o'clock the delegates enjoyed a barbecue, held at the park of the water works, near the demonstration. It was a real feast, the savory meat and sweet potatoes, coffee and other "fillers" were thoroughly enjoyed. Nearly 300 persons were served. Immediately after the barbecue, the crowd was taken in automobiles awaiting in the park as per program, and driven over thirty miles of ideal brick paved country roads. Mr. Blackburn's car headed the procession.

This closed one of the most interesting and valuable days in the history of the National Paving Brick Manufacturers' Association and brick paved highway, for the demonstration and inspection of roads were most convincing to the large delegation of contractors and engineers, many of whom are now enthusiastic advocates of this type of road construction.

The return trip to Terre Haute was made without any unusual incidents, the delegates being content in talking over the experiences of the day. That evening a banquet was served in the Hotel Deming. This was largely attended, the service was splendid and the toasts above par. Mr. Paul Bogart was toastmaster. Toasts were made by John L. Long, editor of the Road Maker; Spencer F. Ball, president of the Chamber of Commerce, Terre Haute; Clinton Cowan, Highway Commissioner of Ohio; W. W. Marr, chief engineer of Illinois Highway Department; Prof. Leonard S. Smith, of the University of Wisconsin; Prof. Ira O. Baker, professor of civil engineering, University of Illinois, and President C. C. Blair. The tables were beautifully decorated with roses furnished by the Dunn Wire-Cut-Lug Brick Company.

PERSONAL NOTES OF THE PAVING BRICK MEETING.

IF ANY ONE could enjoy two days in a better way we would like to know how. We were royally entertained in both Terre Haute, Ind., and Paris, Ill., and left for home feeling well repaid in pleasure and knowledge gained for the time spent.

The paving brick used in the demonstration near Paris were made by the Terre Haute Vitrified Brick Company. They were the usual run of wire-cut-lug brick, well burned, standing a high test.

Many paving brick manufacturers were buttonholed and asked concerning business conditions, the general answer being that business was excellent, the only difficulty experienced was the lack of labor and inability to get cars for shipments.

Mr. C. C. Barr, of the Barr Clay Company, Streator, Ill., and treasurer of the N. P. B. M. A., reported a serious accident at his plant recently—an explosion in the shale pit, due, it is thought, to a spark from the engine of the steam shovel dropping into a can of powder set to one side of the hole in which the workmen were preparing a charge.

Mr. J. W. Robb, of Clinton, Ind., vice-president of the N. B. M. A., was much interested in the Paris demonstration. The first brick used in Paris, Ill., were from his kilns.

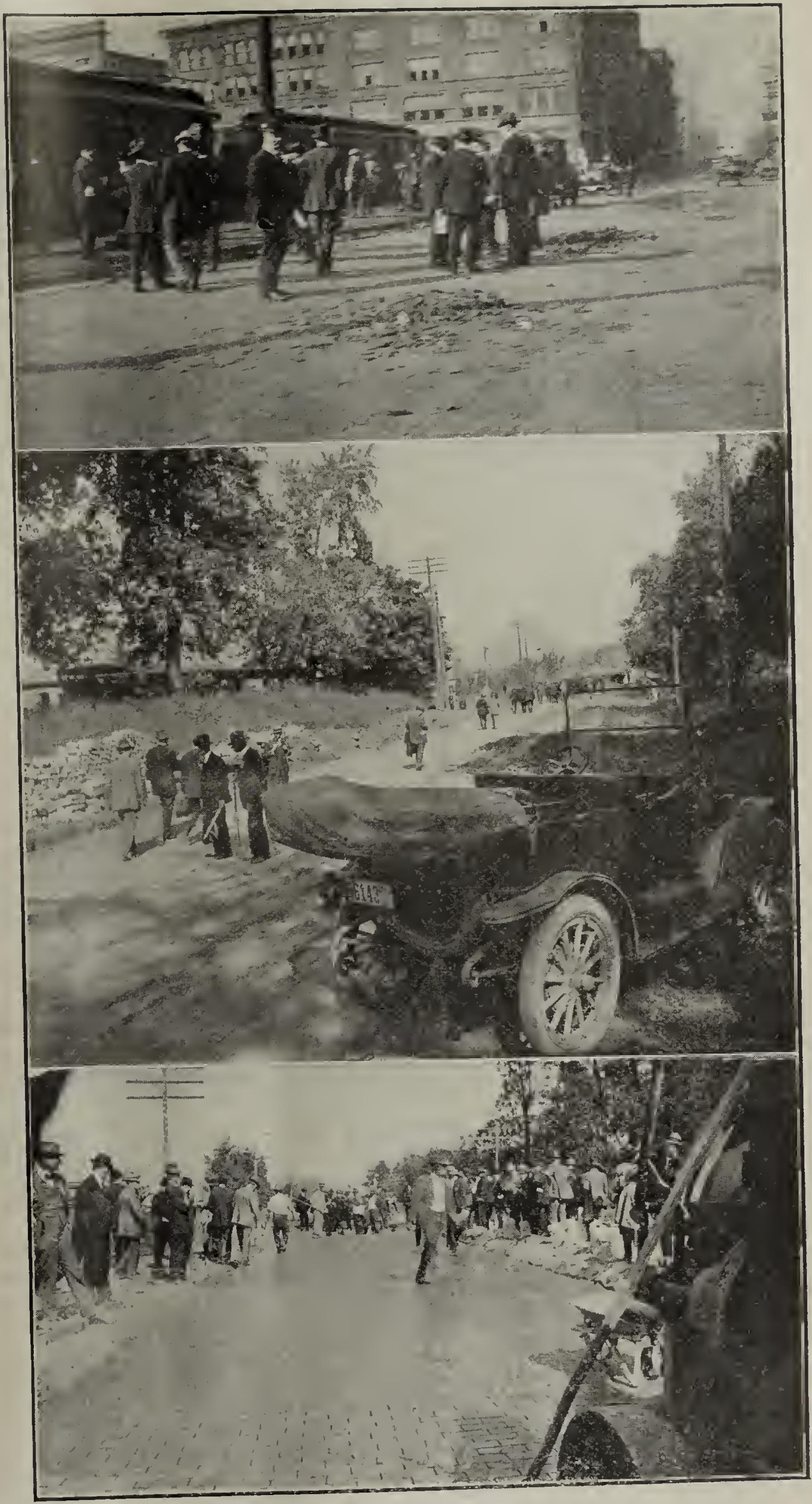
Mayor Hoff made a most striking speech of welcome, giving full credit to brick roads for the prosperity of his commonwealth. It was from the bottom of his heart, too.

Jim Hoskins said that while he was coming down town Friday morning he met himself going home, and that he talked to himself and urged himself not to go home, because his wife had said he must not get home so early in the morning again. Jim says he has often stood aside and watched himself go by.

W. W. Whipple, editor of the Galesburg Evening Mail; Milton Deatherage, A. C. Harve, John A. Johnson, T. L. O'Brien and Charles Sherman, members of the Knox county (Ill.) board of supervisors; Harley Butt, county superintendent of roads, and Bert Woolsey, secretary of the Knox County Good Road Association, were delegates to the convention. An issue of $1,000,000 worth of bonds for the purpose of building permanent roads throughout Knox county is under consideration, so that these gentlemen came to learn the real facts concerning the monolithic type of construction of brick paved country highways.

The Paris band, members of the City Council, State Highway Commission, Chamber of Com-

Inspecting Two Types of Highway Construction.



UPPER PICTURE: Inspecting "Humped" Wooden Block Pavement on Way to Interurban Station, Terre Haute.

CENTER PICTURE: Delegates on Way to the Demonstration of The Monolithic Type of Brick Paving.

LOWER PICTURE: A Crowd of Nearly 400 People Inspecting the Brick Paved Road in Course of Construction.

merce and many well-known citizens of Paris were on hand to welcome the delegation on its arrival at Paris.

Mayor Gossom, City Engineer Kattman, members Rush and Blood of the Board of Public Works, Secretary Clifford of the Chamber of Commerce and many other notables witnessed the demonstration and partook of the serve-self dinner at the barbecue.

"Marse" John Sibley, of Birmingham, Ala., treasurer of the National Brick Manufacturers' Association for lo! these twenty odd years, was a delegate representing the Southern Paving Brick Manufacturers' Association.

Mr. Eben Rogers, of Alton fame, participated in the business sessions and never missed a single part of the enjoyable two-days' program.

"The real feature of this meeting of our Association is the fact that so many great men of the country—men who are experts in roadmaking and in all the sciences that pertain to it—have come here to witness the demonstrations which are to be carried on tomorrow; that with all their knowledge they come to study and, if possible, learn more. And why do they come? Because they realize that the great economical question now before us is the perfection of roadmaking, so as to get permanency and at the some time save the taxpayers all possible expense."

The above is an expression credited Secretary W. P. Blair in the Terre Haute morning paper of October 5.

Mr. C. C. Blair, president of the N. P. B. M. A., was reelected, as were the other officers of the association. This unanimous vote of the members is a high compliment to the officers for their most satisfactory services rendered the organization during the past year.

That live wire bunch of the Dunn Wire-Cut Lug Brick Co. was in the limelight from start to finish. The delegation consisted of nine members of the organization, as shown in the snapshot picture on page 331 of this issue. Reading from left to right: T. T. Townsend, assistant engineer; E. V. Schmidt, assistant engineer; W. C. Perkins, chief engineer; F. A. Churchill, manager of the press service; Miss B. E. Kinner, secretary; Frank B. Dunn, president; H. G. Lehrbach, assistant engineer, and W. T. Blackburn, construction engineer. These delegates had few idle moments during the meeting. This company, the licensors of the Dunn wire-cut lug brick, now have thirty-four operating concerns, representing fifty-four high-grade paving brick plants. This is a remarkable growth since they started with only two companies with two plants, the first of January, 1911. The licensed plants are located in eleven different states with unusual facilities in transportation. Of particular interest is the record of the brick sold and the yards laid in the phenomenal growth of this concern.

Year	Brick Sold	Yards Laid
1910	2,225,800	55,645
1911	7,572,250	189,306
1912	25,024,064	625,601
1913	36,913,845	922,846
1914	104,827,420	2,620,685
1915	138,276,174	3,456,904
Totals	314,839,553	7,870,987

The sales for 1916 will greatly exceed those of 1915. The sales in July, 1916, were up to that time the greatest of any month in the history of the business. The sales in August, 1916, were 29 per cent more than in July. The August sales amounted to more than the shipments of the entire year of 1912. This shows the increasing popularity in this type of paving brick. We wish to congratulate the company on their well deserved success and increasing prosperity.

PAVE WITH BRICK

Written for The Clay-Worker.

AMONG PHILADELPHIA BRICKMAKERS.

BUSINESS CONDITIONS current with the brick and allied manufacturing industry of Philadelphia and vicinity are reported by members of the trade here to have undergone but little change during the month of September. Generally, with the building brick manufacturers, the conditions existing during the past month were about on a par with those reported for August. Practically all the local plants had sufficient business on hand to necessitate the steadiest of operation, but despite this many new orders of size were recorded, and these coupled with the heavy volume of building brick business placed during the two preceding months will tend to keep the brickyards of this locality running smoothly for some little time distant.

Like the demand for building brick, clay tile and terra cotta trimmings, there was a strong inquiry for sewer brick. This brick has been experiencing a particularly pleasing demand for several months in and about Philadelphia, to which business the present city officials have contributed admirably. Although it has not been made as an official announcement by any of the respective heads of the departments of public works, etc., it is pretty well understood in the trade that the present administration officials are partial to brick as an economic sewer building material.

The vitrified paving brick business continues to be the slowest of the numerous clay materials produced in this section of Pennsylvania and is, in fact, the only drawback to what would otherwise have been a perfect year for the local clayworking industry. There has been no change in conditions affecting the vitrified paving brick business during the past month, and none is now anticipated until next spring, for which present indications are very good.

September with the Philadelphia building trades represented a decline in building operations authorized by the Bureau of Building Inspection; but, while this is true, figures as compiled by Statistician William Gamble, of the Bureau, for the nine-months' period ending with the advent of October show the total cost of building work authorized during this part of 1916 as having been $35,923,435. This is an increase of some $4,363,955 worth of building work over the corresponding period of 1915. The estimated cost of all buildings for which permits were issued during September is $3,901,310. In comparison with August of this year this is a decrease of $1,170,810, and in comparison with September of 1915—the best September experienced here within the last ten years—it is a decrease of $1,430,360.

Title has recently been taken to a twenty-three-acre tract at the intersection of the Pennsylvania railroad and the Philadelphia & Reading railroad at the Northeast boulevard and Adams avenue, Philadelphia, by James J. Allen as a site for a large brick manufacturing plant. The tract is adjacent to the brickyards of Edward Kelley and the Keystone Brick Company. Together with the improvements which are to be made and the equipment to be installed, the new project will represent an outlay of approximately $50,000.

Among the numerous brick works of Philadelphia which have been enjoying a particularly satisfying volume of business during the past few months is that of William Conway, at Fifty-eighth and Walnut streets. Business with the Conway enterprise at this time is reported to be of a splendid seasonable volume.

Brick is playing a conspicuous part in that portion of the new Philadelphia trolley subway passing beneath the City Hall building, at Broad and Market streets. More than one-half of the crumbling foundation walls under the City Hall building, one of the most costly and heaviest structures in the world, have been replaced by brick walls, more than five feet wide, resting on steel girders imbedded in concrete. Engineering observations of this feat indicate that the work of replacing the foundations has not caused any realignment throughout the big structure.

A QUAKER.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART V.

The Burning Process.

THE BURNING PROCESS may be divided into a number of stages as follows: (1) Drying, commonly called watersmoking. (2) Oxidation and dehydration. (3) Bonding or shrinkage. (4) Vitrification. (5) Annealing and cooling.

Watersmoking.

Few clay wares, particularly the common wares, are fully dry when set in the kiln. Hygroscopic water is not driven off at atmospheric temperature or even at the boiling point of water; in fact, wares from dryers having temperatures as high as 300 degrees F. seem to contain some moisture, as shown by the operation of the kiln.

Generally the wares are far from dry through imperfect dryer operation, and some wares, such as dry pressed bricks, are placed direct from the machine into the kiln wherein the drying is accomplished.

The watersmoking is slow or rapid as the ware will permit. Dry pressed wares require from five to thirty days slow drying in the kiln, from five to eight days being the customary period. Mud products, which have been previously dried, can be watersmoked quickly in from twelve to seventy-two hours.

The watersmoking is accomplished by low fires in the kiln furnaces. Wood is frequently used for this purpose, to avoid scumming and sooting.

Scumming is caused by the combination of sulphur gases, moisture and lime or other minerals in the clay. The clay may not contain lime in sufficient quantity, in which event there will be no scumming, and watersmoking may be done with a sulphurous fuel, or it may be that scumming is less serious than the cost of a special fuel to prevent it. Scumming is largely a dryer trouble, and the development of a little more in the kiln may be of no consequence.

The combination of cold ware, moisture and a smoky gas deposits soot which often fills the draft spaces among the ware and stops the draft. This is a common occurrence in watersmoking with bituminous coal.

Some factories watersmoke with anthracite, coke or smokeless coal and finish the burn with bituminous coal; but many factories find it possible to use bituminous from start to finish.

In the watersmoking period we desire to heat up the ware, evaporate and remove the moisture; and, to accomplish this, particularly the removal of the moisture, it is essential that the draft be strong. Unfortunately it is a period of weak draft, because the kiln, stack and ware are cold and the fire is low.

There is an advantage in having two or four periodic kilns connected with a single stack having an individual flue for each kiln. Under such an arrangement the chances of having a hot stack to start the watersmoking are more favorable. In some instances where the stack is a single one, it is provided with a small furnace in the base to heat up the stack and the gases contained therein. A steam jet also may be used for the same purpose.

Oxidization.

As soon as the watersmoking is completed, and, in fact, in many products during the watersmoking, the temperature is advanced to that required in oxidation.

The several periods in the burning process are not distinctly separate but always overlap more or less.

Oxidation begins in the later stages of the watersmoking and continues into the shrinkage stage, but the greater part of the oxidation occurs at a low red heat—800 degrees F. to 1,300 degrees F. The oxidation includes the oxidation of the carbon, the decarbonization of the carbonates, the desulphurization of the sulphides, the oxidation of the ferrous oxide and the dehydration of the hydrated minerals, particularly the kaolin base.

Sulphur begins to come off from pyrite at low temperatures, but the expulsion does not become rapid until a temperature of 700 degrees F. is reached, which is below a visible red heat. The greater part of the sulphur comes off between 700 degrees and 1,300 degrees.

Carbon ignites at about 850 degrees F. and the oxidation continues up to about 2,000 degrees F. It is, of course, important that the carbon be oxidized at low temperatures; first, because the oxidation is more rapid at low temperatures, and second, because many clays fuse at lower temperatures than 2,000 degrees, and bloating would result if the carbon were not expelled before fusion begins. It is also important that the ferrous oxides, both those originally in the clay and those developed from the sulphides and carbonates, be oxidized before a fusing temperature is reached, and this oxidation cannot take place until the carbon is removed.

The carbonates dissociate between 700 degrees F. and 1,600 degrees F. (iron carbonate, 732 degrees F.; magnesium carbonate, 1,380 degrees F., and calcium carbonate, 1,526 degrees F.) Even the maximum dissociation temperature is 300 to 400 degrees below the finishing temperature of an average low burning temperature ware.

It is our experience that dehydration of the clay base—the expulsion of the chemically combined water—takes place between 800 degrees F. and 900 degrees F., but several authorities claim that dehydration begins at a much lower temperature, even as low as 212 degrees F.

There are other hydrous minerals besides kaolin in a clay mass, and undoubtedly some of these dehydrate at much lower temperatures than kaolin. We know that a temperature of several hundred degrees is necessary to remove completely the hygroscopic water, but the water may contain some soluble salts in solution or may easily be acidulated with sulphuric acid which would require higher temperatures to remove the water content.

There is a marked decrease in the weight of the mass at about 850 degrees F., and this we attribute to the dissociation of the kaolin base. Combined water and sulphur are both coming off rapidly at about the same temperature, and this is the "blue smoke" period of the burning, although the "blue smoke," which is due to the sulphur, continues long after the combined water has been driven off. Nine hundred degrees is a very low red heat, barely visible through the kiln peephole.

Shrinkage Period.

The shrinkage or bonding period covers the fusion from the start up to that required for a thoroughly bonded ware, and it marks the burning range of the clay. We distinguish between burning range and vitrification range in the same sense that we distinguish between ordinary ware and vitrified ware.

The average common clay begins to shrink in a measurable degree at about cone 010 (1,742 degrees F.), but seldom is the fusion sufficiently advanced to develop a permanent bond until cone 07 (1,850 degrees F.) is down, and more frequently not until cone 04 is turned. The maximum temperatures are rather a question of fuel cost than the limit of the clay. We have seen common clay products which required a temperature up to cone 10.

Shale products range from cone 04 to cone 5; No. 2 fire clay products from cone 1 to cone 9; No. 1 fire clay from cone 5 to cone 14; silica and magnesite bricks up to cone 28. The temperatures are totals and include the vitrification range in vitrified products.

The vitrification period is simply an extension of the bonding period to a more complete fusion.

Vitrification.

The term vitrification is used very loosely in the ceramic industries. Sewer pipe and paving brick bodies are vitrified, yet an examination of the body in the majority of instances shows a large percentage of mineral grains which have not entered into the fusion.

These vitrified bodies will absorb water up to 10 per cent. in some instances, and 3 per cent. to 5 per cent. absorption is of common occurrence.

Porcelains are also vitrified, and there is a big gap between porcelain and vitrified bricks.

The only reason for assigning a burning period to vitrification is that there is a definite product classed as vitrified, such as paving bricks, sewer pipe and electrical conduits, and there is a limitation in the clays which will produce such products.

There is no change in the burning process—we merely advance the heat to the vitrifying point and hold it until all the ware in the kiln is properly burned. It would be more proper to say heatsoaking period, since the production of all hard-burned ware or vitrified ware requires a period of heatsoaking in order to get some degree of uniformity throughout the kiln. We may burn common bricks and impervious face bricks to the same temperature—let us say cone 1—but when this cone is reached the common brick kiln is held for a very short period thereafter, while the face brick kiln is held for a longer period.

In the common brick kiln we may have a variation of seven to eight cones between the bottom and top of the kiln, and yet have a satisfactory ware throughout the kiln. In the face brick kiln we must hold the heat until the difference in temperature is reduced to three or at most four cones to get a satisfactory product. The only difference in vitrified products is that the finishing heat is nearer the failure point of the material, and in consequence requires greater care.

In this connection, we wish to make a note in regard to fuel consumption. We often get information that certain products are burned to cone 1, for example, with 300 pounds of coal per ton, while someone else is doing the same work with 200 pounds.

Why? Assume that the coal is the same, the kiln the same, and the burners equally efficient; the difference may be entirely due to a soaking heat, given by one and not by the other. There are differences in the clay, in the coal, in the kilns, both type and size; in the draft, in the efficiency of the burners, and in the results to be obtained from the kiln, although cone 1 may be the temperature in both instances.

To make any comparison, all this data must be given and taken into consideration.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

INCREASING PRICES for common brick have caused all New Jersey makers to speed up their plants, so far as they can, and increase the output at each burning. Prices are now $8.00 or more, and all indications point to even higher prices in the months to come, since makers have curtailed their output some this season, largely because of the difficulty of getting sufficient labor. All industries are driven with orders in New Jersey, and some of the munition factories pay any kind of a man whatever is necessary to get him. And brickyards have suffered from this competition. Production has not been so large all summer as it is some seasons, but it has been up to capacity, when all these troublesome influences have been taken into consideration.

As the season draws to its close reports from substantially all centers are to the effect that it has been a prosperous one, perhaps quite the most satisfactory from the standpoint of the seller of recent years. Common brick has been at a high figure all the year. And it closes the season with a sharp upward tendency. The quantity available for storage will be small and all plants equipped for winter operation do not intend to shut down. They will run continuously all winter, and in some instances the product is sold to be delivered as made.

The outlook for next spring is better than it has been for years at the same season of the year. Good prospects for building exist, and architects are now at work on plans which will call for millions of brick next summer. The brick for the Hackensack High School, to cost $200,000, have not yet been bought, but that is about the only important operation actually in progress in the northern portion of the state for which the brick are yet to be chosen.

Hackensack brickmakers are preparing for the last burning of the season. One is now going out and the last one is drying on the yards ready to go into the kilns. Schooners and barges are busy taking away the product. All makers along the Hackensack river report good business, some better than others, perhaps, but all have shared to some extent in the increased business of the year.

The Homestead Brick Company, of Homestead, is laying up its kilns for its last burning this year. The company has had a good business all summer, and its yards are virtually clear of product now. Lying so near Jersey City that transportation costs are negligible, this company has always enjoyed a good home market, and does yet. Making a good product, it has insured a continuation of its business as long as brick form a considerable proportion of building material.

A. L. B.

BLASTING DOWN SHALE AND PLASTIC CLAY.

(Continued from the August Number.)

MINING FLINT CLAYS.

The underground mining of siliceous fire clays is practiced much as is coal mining, using the pillar and room method. The entry being established, the rooms should be only as wide as the nature of the roof will stand. The pillars should be wide and in keeping with the weight they must bear.

Flint clays occur in a variety of ways. They may overlie softer clay or may be covered with more or less coal. When the height of the coal is sufficient to make the operation pay, it should be mined off first. If not, care must be taken not to get the coal mixed into the clay. When this is done for some distance the clay can be lifted by slab shots loaded in deep and nearly flat holes. This method has the additional advantage of getting the coal and waste out of the way before the clay is disturbed and reduces the danger of mixing objectionable matter with the clay.

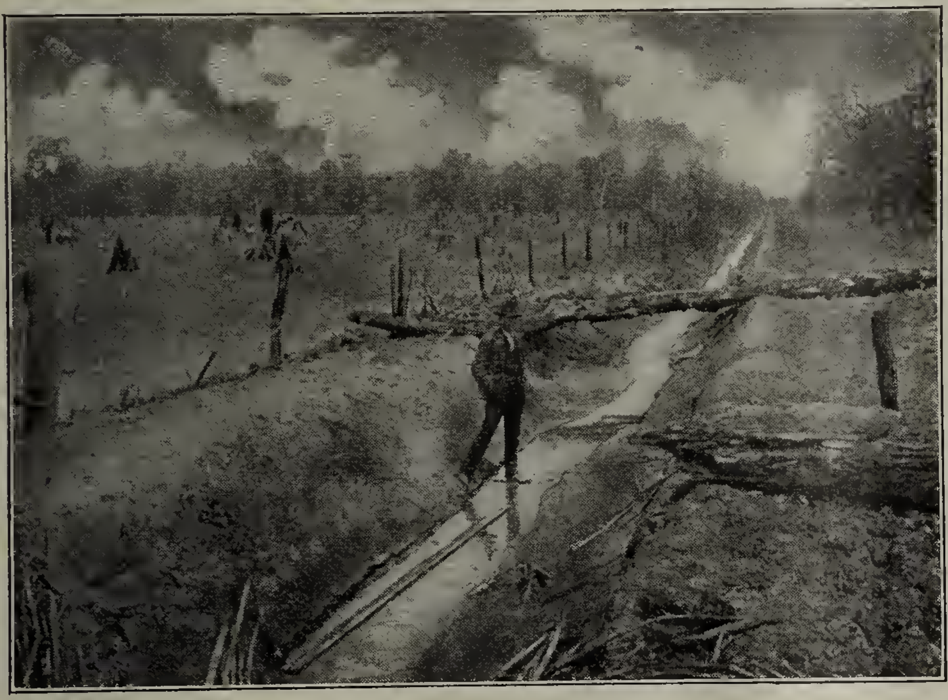


Fig. 27. A Blasted Ditch.

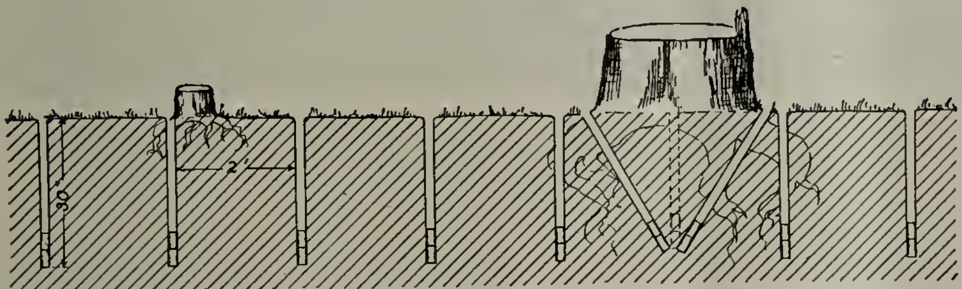


Fig. 28. Method of Loading to Blast a Ditch Through a Swamp.

When the soft clay is of sufficient height, and the coal not of a quality to mine, the soft material should first be mined out. When this is done the hard clay is shot down by means of flat holes.

For "breaking-in" or "cut" shots in opening up a header or breast, a variety of methods are employed. The best advantage should always be taken of all slips or faults. Many prefer a single breaking-in shot, such as is represented in figure 25, while some, especially where the clay is hard to break, prefer to load two holes pointing together instead of the single shot at "1," figure 25. For some clays decided variations from these methods are required to suit the peculiarity of the ground.

The rib and slab shots are usually drilled to the full depth of the "cut" or "break in" and carry a burden of about 3 to 4 feet.

The parting at top and bottom is usually so good that lifters and back snots are not required.

The shooting of flint clay requires much care, as it is likely to be broken so fine that the loss as waste reduces the output of the mine.

Formerly all flint clay was mined with blasting powder, but this is being replaced by 40 per cent. Red Cross dynamite. The use of electric blasting caps is strongly recommended, as they are more in order with the "safety first" idea; if the shot fails there is not any hang fire, and the miner can return to the working face to locate the trouble. Failing to find the trouble, he can proceed to bore another hole about one foot from the miss shot, while a miss shot with fuse means losing the day's work.

For a reduction of the trouble from fumes the use of Monobel No. 1 is to be recommended. This is a permissible explosive, especially prepared for hard underground work, and breaks down the ground in better lump condition than do quicker-acting explosives. There is a greater number of sticks to the case than dynamite.

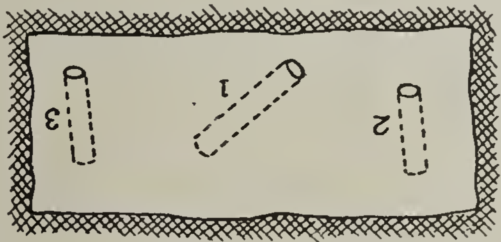


Fig. 25. A Much Used "Breaking-in" Shot. The Holes Are Bored and Loaded in Order Numbered.

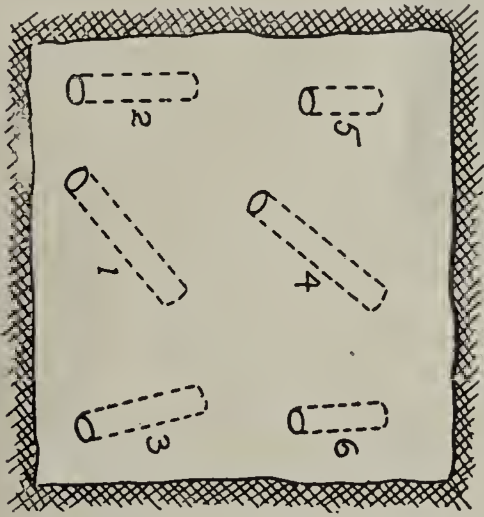


Fig. 26. A Good Method of Loading the "Break in" in High Clay. The Shots Are Bored and Fired in Order as Numbered. Frequently Either 2, 3, 5 or 6 Can Be Omitted.

Draining Clay Pits.

When ditching must be done to drain open clay pits, the work is usually difficult on account of the wet nature of the ground and the heavy digging. Such ditching can well be done by properly loaded blasts, using either of the methods described in the following paragraphs.

The first thing to do is to try a few trial shots to ascertain the best depth and spacing for the holes. For ditches up to 3 or 3½ feet deep the depth of bore holes will usually be about 24 to 30 inches, and the spacing between holes from 18 to 24 inches, although it may be necessary to increase the depth and decrease the spacing in some cases. It is well to begin the test with holes 2 feet deep and 18 inches apart. Keep these in line and load about ten of them with one cartridge each. If a little water covers the cartridges in the holes no further tamping will be needed. If not, tamp well with earth. After the entire line is loaded, one hole is charged with an extra primer cartridge, and it is also well to put one additional in each hole adjoining the primer.

This loading should lift the soil at least 200 feet into the air, scatter it for a distance of 150 feet and leave a good, clean ditch. If it does not, try a different loading. It may be necessary to make the holes deep in some soils and not so deep in others. Usually in wet soils the ditch made is a foot to 2 feet deeper than the charge, but sometimes it is necessary to load to the full depth.

If the test shot makes too large a ditch, the spacing can be increased a little, but unless the electric method is used should seldom be greater than 24 inches, and then only in warm soil. For very small ditches, less than a cartridge may be used in each hole.

Ditching in Saturated Soils Without a Blasting Machine.—In wet soils, where holes 2 feet deep will stand half full of water, the quickest and generally the most economical method of ditching is with Du Pont Straight 50 per cent. dynamite. Only a straight dynamite can be used for this work, as other grades are too insensitive to be detonated by the shock from a single primer in a central hole. This can be practiced in the roughest of swamps, even where there are several inches of water standing on the surface or where the surface is covered with the heaviest stumps.

This class of ditch blasting should not be attempted when either the air or water is colder than 50 degrees F. In cold weather and in dry soils only ditch blasting with electric blasting caps should be practiced.

The simplicity of the method and the truly wonderful results obtained must be seen to be fully realized.

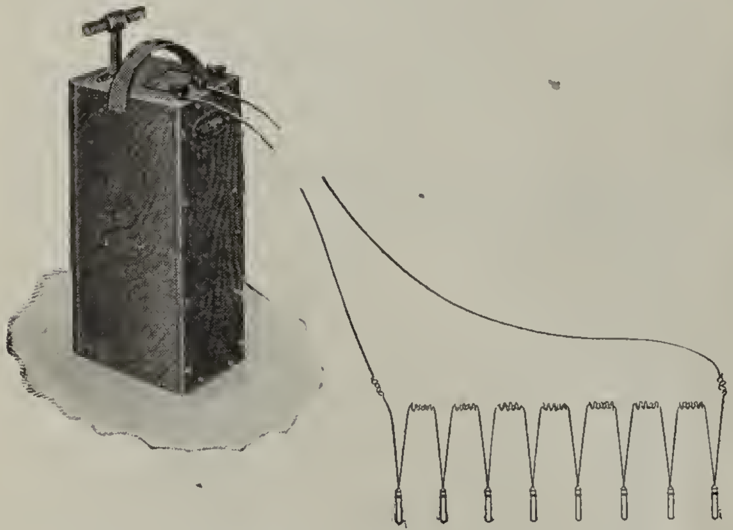


Fig. 29. Method of Connecting Wires For Electric Blast.

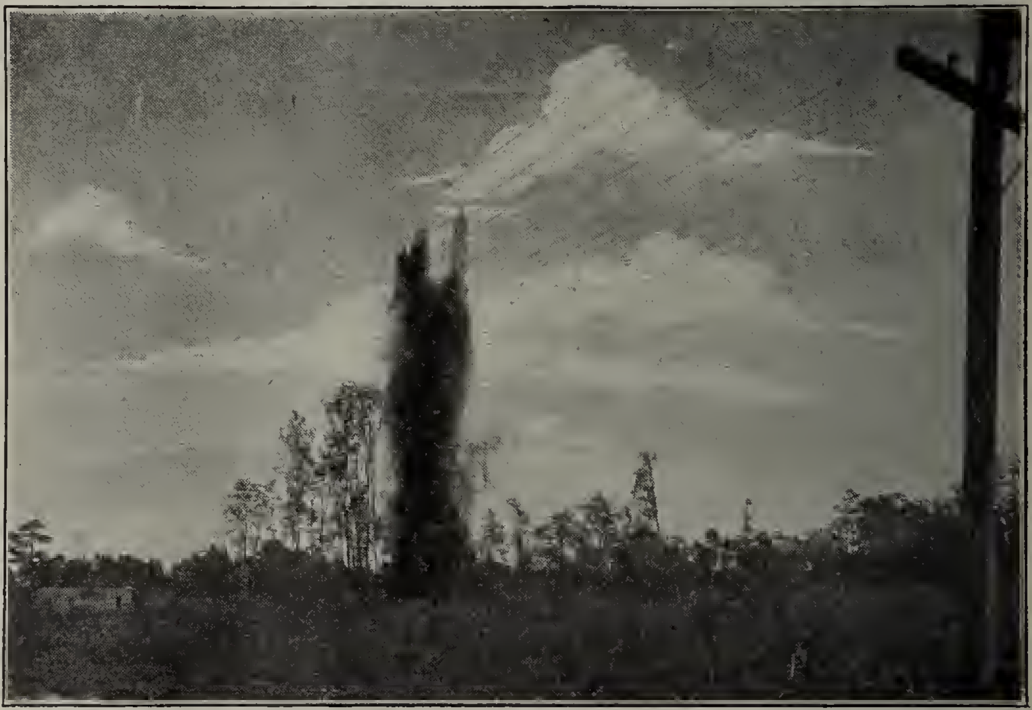


Fig. 30. A Short Test-Shot for Ditching, Showing How the Earth is Thrown Out.

Larger ditches can be dug by using two or more cartridges in each hole, and a second, or even a third line of holes may be put down about 4 to 5 feet from the original line and loaded in the same way, when greater width is desired. When two or three lines of holes are used it will be necessary to use one electric blasting cap in each line, or to put in one or two extra charges between the rows to insure the simultaneous detonation of all the charges.

Putting Down the Holes.—Ordinarily in wet soils the bore holes can be put down with little effort. If the soil is at all hard, or has a heavy crust, the fastest tool is a good sharp crowbar, but if soft and mucky, a heavy tamping stick will suffice. The holes should not be left open, but should be loaded at once, as they will cave in or be filled with floating slime.

Ditching With a Blasting Machine.—While it is possible to blast ditches by the propagated method (that is, without blasting machine), only in wet soils in warm weather, the electric method can be employed in any class of material, dry sand excepted, and low strengths of low-freezing Red Cross Extras can be substituted for the more sensitive straight dynamite.

The lay out of the ditch is exactly the same as for the other method, but as an electric blasting cap is used in each hole it is possible to space then farther apart in the row. The normal distances are from 24 to 32 inches for small ditches and up to 48 and 52 inches for large ditches.

Different Explosives for Different Classes of Work.—The explosive selected for electric ditch blasting will depend upon the soil and size of ditch. In a medium loam, where only a small ditch (for instance, 2 feet deep and 3 feet wide) is desired, the selection may be Red Cross Stumping Powder, Red Cross Extra 30 per cent. or 40 per cent. Where the material is very sandy Du Pont Gelatin 40 per cent. will give the best results. It is practically impossible to blast ditches in dry sand.

For larger ditches, or where there is much trouble with stumps and roots, a stronger explosive will give more economical excavation, and Red Cross Extra 40 per cent. dynamite or Red Cross Gelatin 40 per cent. should be selected. Where the work is very wet, and the charges must be left in water for a long time, gelatin should be selected, as it is more water-resisting than dynamite.

Methods of Loading.—After three or four trial shots similar to those described for wet ditching have established the proper depth and spacing of the holes, and the amount of dynamite per hole, the blaster is ready to begin actual operations. The holes may be put down with a subsoil punch, crowbar, soil auger, or any other tool suitable for the particular class of soil.

Unless water covers all charges they should be thoroughly tamped. It is best to punch only enough holes for one blast, load them and fire, before putting down more, as they are likely to be filled up or covered with trash thrown up by the blast. Do not overload the blasting machine. If its rated capacity is thirty electric blasting caps do not attempt to fire more than that at a time.

When only one cartridge is used in a hole it must contain the electric blasting cap, and should be pressed well down to the bottom of the hole and tamped so that there is no air space left to reduce the effect of the blast. When several cartridges are used in each hole the primer should be on top, with the closed end of the cap pointing downward.

As the work progresses the soil should be carefully watched, and any needed variation made in the loading so that it may always conform to the material to be lifted.

Blasting Large Ditches With a Blasting Machine.—When larger ditches are desired the loading may be in deeper holes, using more or a higher strength of explosive; or one or two more parallel lines of holes may be employed, especially where wide but shallow ditches are needed. Where very deep ditches are needed, blast a wide, shallow ditch with two or three parallel rows of holes, and then load one or two rows in the bottom of the shallow ditch, and blast another ditch in the bottom of the first one. This latter method has been very efficient in opening large ditches 8 or 9 feet deep through heavy bottom lands for the correction of stream channels.

Among the most striking advantages of ditching with dynamite, as compared to other methods, is the reduction in cost, the absence of a large spoil pile along the ditch, the little time required, the absence of overhead expenses for equipment, the ability to dig successfully where the conditions are too bad for other methods, the adaptability to both large and small ditches, and the simplicity of the methods.

Stream Correction.

Many open clay pits are troubled from back water from streams. Explosives can be used to good advantage in correcting faulty streams.

Fig. 31.
A Large Ditch Blasted With Du Pont Dynamite.

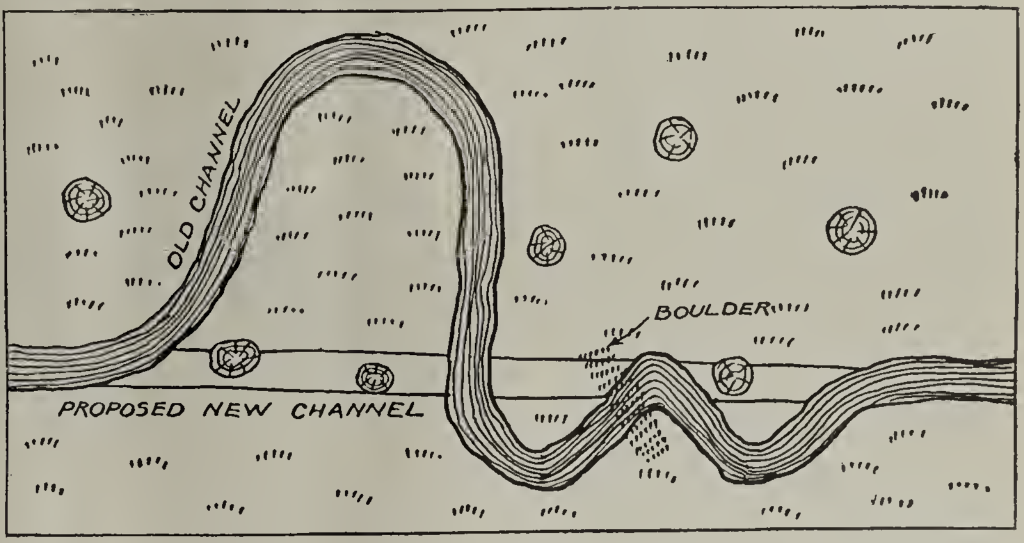


Fig. 32.
Diagram of Stream Troubles That May Be Corrected by Blasting.

Fuller information with regard to ditching and stream correction are given in the Du Pont Farmers' Handbook, a copy of which may be had on application.

FIRE PREVENTION DAY.

That it is good to have a fire prevention day in schools and in municipalities all those in the clayworking industry will readily agree. Also it seems to us as particularly appropriate that this fire prevention matter should be brought before the public mind in the fall of the year at the beginning of the cold weather season. Entirely aside and apart from that order of fire prevention which leads to building entirely of fire-proofing materials, it is certainly good for the public and for the welfare of the country to have an annual round-up or clean-up at the beginning of the winter season, with the object of reducing the fire hazard. The greatest number of fires occur during the winter, when the fires must be kept going everywhere to make homes and buildings warm, therefore just at the time of starting into the season of building fires there should naturally be a time of cleaning up and taking precautions, of overhauling the fireplaces and chimney flues and cleaning out rubbish and cleaning up generally, both in the homes and among the factories, to the end that there may be fewer disastrous fires. The building of homes and other structures of material that will not burn, as a means of fire prevention in the future, should really be taught in the schools all the time, for that is the ultimate goal of all fire prevention ideas. Meantime, however, it is good to have a fire prevention day and a session of cleaning up in the fall, with this point in view, just as we have a session of clean-up and paint-up in the spring to beautify the surroundings, the main difference being that the central object in the game is that of taking all practical precautions to prevent the outbreak of fires during the winter season.

There are two disturbing features which the industry has to contend with, one being the car shortage and the other the labor scarcity. The lumber industry is demanding a large number of men for work in the camps during the winter, and it was expected that operations in the woods would be started earlier this season, because the shortage last winter taught a lesson. There are numerous other sources which are draining the labor supply, such as mining and many other industries, which during recent months have been working at capacity.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

EXCEPTIONALLY good business conditions predominate in the industries of the Badger State, and as a result the construction work in its various branches has felt the effects to an extent that both contractors as well as building material supply manufacturers and dealers will extend operations much later this year than usual. Reports from various cities in the state show that this condition exists generally. Notwithstanding the fact that the building operations authorized in Milwaukee during the past month show a decrease over the corresponding month of 1915, there are several large permits to be issued before long, and the gain to date in the amount expended this year will be considerably increased. There were 357 permits authorized by Building Inspector W. D. Harper in September, representing construction work amounting to $840,557. This has brought the year's total to 3,121 permits and $10,322,997, compared with 3,070 permits representing $9,611,145 during the same period of 1915. Among the work yet to be authorized this year is the new twelve-story Athletic Club building, several large apartment buildings and numerous large construction jobs in the industrial line.

A rather novel use for paving brick in this locality was made recently in the vicinity of Zenda, Wis., when the Palmer Brothers, operating a farm near that village, constructed a corn silo of this material. The finished structure presents a very attractive appearance. The walls are reinforced every two feet as in other types of brick silos. Mr. Palmer stated that he built a paving brick silo because it is as cheap to build as any other. He is well pleased with the looks of it, and says that he has every reason to believe that it will prove to be as good as any other.

A contractor recently interviewed stated that one of the reasons for the remarkable amount of construction work under way at this season was due to the fact that many persons held off building eight and ten months ago, expecting a drop in the prices of materials. Since this has not come about and is not expected at this time, the contemplated work is materializing. That building operations are active in general can be seen from a few of the larger contracts let for work during the past few weeks. At Cudahy, Wis., a $200,000 addition is being awarded for the Federal Rubber Manufacturing Company. The Acme Brick and Sand Company secured the brick contract for six stories, 157x100 feet. At Osceola, Wis., a new solid brick hotel, three stories high, is being erected. St. Patrick's congregation at Elroy, Wis., is erecting a solid brick school, costing $25,000. The general contract for the new high school at Park Falls, Wis., was let at nearly $35,000, for a brick structure, total cost $50,000. Osborn, Wis., is to have a brick veneered hollow tile school. A solid brick structure costing $40,000 is being erected at Beloit, Wis. The addition to the college of the Capuchin Fathers, Mt. Calvary, near Fond du Lac, Wis., will cost $45,000, and provides for solid brick walls. A modern business block, of brick construction, is being erected on Main street at Fort Atkinson, Wis. One of the largest contracts of the year at Beloit, Wis., was in connection with a mammoth foundry for the Stewart-Warner Corporation.

In Milwaukee, a brick and hollow tile apartment building is under construction on Wells street, near Sixth street. The Stratford Arms hotel and apartment, at Grand avenue and Fourteenth street, has been authorized at a cost of $125,000, having four stories of brick, 150x102 feet. Architects Martin Tullgren & Sons, 133 Second street, are planning a $100,000 building to contain sixty apartments, at Grand avenue and Sixteenth street. It will be of solid brick, with tile floors, etc. Brick construction will feature the new animal house at the Washington Park Zoo, on which contracts are to be let shortly. This work will cost $50,000. Several solid brick residences have also been constructed here this summer on the upper east side, of elaborate plans and well up in the thousands. The city of Milwaukee will erect a new natatorium on Hayes and Fifth avenue, of brick, 80x100 feet, with a swimming tank lined with mosaic tile or English face brick. Numerous brick garages, costing from $5,000 to $25,000, are being erected in various parts of the city. A recent industrial building announced, to be of brick construction, is that of the Milwaukee Dairy and Supply Company, at Burleigh and Thirtieth streets. It will be 120x127 feet.

Paving work generally is not such an important factor in the clay industry at the present time, as there is not very much of this type of construction being started. Many of the cities where brick is used extensively have practically cleaned up their season's allotments. Merrill, Wis., awarded to the Conductive Paving Company, of Chicago, the vitrified block contract on two streets at $2.09 per square yard. A nice job of brick pavement is being laid at Oshkosh, Wis.

Those connected with the clay products industry, especially vitrified paving block, should be interested in plans now being laid for work next season. The Milwaukee County Board of Supervisors will receive the report of the finance committee shortly, which provides in the budget $350,000 for road construction in 1917. This will place at the disposal of the road fund, with the state aid allotment, approximately $536,000.

The clay industry at West Allis, Wis., has been augmented by the organization of the Milwaukee Pottery Company, which recently purchased a site of one and one-half acres at Sixty-ninth avenue and Hicks street. A building, 80x160 feet, has been erected and equipped with four kilns and modern machinery for the manufacture of glazed and fancy pottery. Operations will commence this month. The organizers of the concern are Louis Weis, formerly of the Weis & Schmidt Pottery Company, and H. F. Schuette, both of Milwaukee.

Fire in the roof of the kiln shed of F. H. Haumersen & Sons, brick manufacturers at Racine, Wis., recently caused a slight loss. The blaze was caused by overheating in a kiln just completed, containing 400,000 bricks. The Racine fire department reached the scene in record time, so that the fire was extinguished after causing a loss of only about $100.

A BADGER.

BRICK ON THE FARM.

We are constantly discovering many new uses for brick on the farm and many wide possibilities for development of trade by cultivating possibilities of farm construction work, aside from dwellings proper. An illustrative instance is found in connection with Farmers' Bulletin No. 744 of the Department of Agriculture, recently issued, which deals with the preservative treatment of farm timbers.

This bulletin goes into elaborate detail about fence posts in particular, and tells how the life of these and other posts and timbers on the farm can be prolonged by creosote treating. Among the different appliances illustrated and recommended for various uses in this connection, one shown is that of a metal tank for open tank treatment, surrounded with a brick furnace.

It is apparent, from what investigations have been made so far and the resultant ideas, that we have only begun to develop possibilities of brick and clay products on the farm. Here is a field in which there is room for much fruitful research work, which we hope will be taken up and followed persistently, because it will mean a whole lot to the future of the clayworking industry.

Slow collections tend to check the speed of industry. Let us make prompt pay the slogan for a while and see if it will not help speed things up.

A GREAT CLAYWORKING ESTABLISHMENT.

The Fords Porcelain Works and its Products an Important Factor in Better Living, Affording Sanitary Comforts Unknown to Former Generations.

"NEVER BEFORE in the history of the world was life more enjoyable, better worth the living than now. In this day and age the average mortal has comforts never before enjoyed." So spoke an octogenarian at a recent public function. He admitted he was an optimist by nature, and declared that the human family would be happier and more content could they cultivate a spirt of optimism in the common, everyday affairs of life.

He is assuredly a wise man; hale, hearty, and as active at the age of eighty as most men at fifty. He is an object lesson in right living. If we mortals could all follow his fine example we might in a few years see the average span of life extended to the century mark. One of the important elements that tend to lengthen life and improve the general health and comfort is the sanitation of homes and workshops, stores and factories. Those who have promoted the manufacture and use of sanitary ware are benefactors to whom we are all indebted. Foremost among the leaders in this line of industry is Abel Hansen, Perth Amboy, N. J., the manager and directing head of the Fords Porcelain Works of New Jersey.

Abel Hansen, Perth Amboy, N. J.

The "Old Oaken Bucket" is attractive in sentiment, but it has no place in the modern home or factory. The demands that are made upon the busy man's time today are such that he must have every convenience for his personal comfort—every necessity of his daily work and home life must be right at his finger tips.

The first lavatory ever invented was a tin basin and a wooden chair. That was before the days of exclusive residence districts and apartment houses—before plumbing had developed past the well-digging stage. There were no piping, no running water, no hot water tanks, no filters or drains, not even faucets.

From this crude beginning the lavatory has gradually developed, passing through various stages of improvement as to convenience and cleanliness until it has reached the zenith of perfection in clealiness, sanitation, convenience and economy in Fords porcelain lavatories. They embody every feature that is essential in a household necessity of this kind—comfort, convenience, cleanliness, attractiveness, durability.

They have a monolithic, marble-like surface that is no effort to keep spick and span. The surface of the bowl is finished to such a degree of hardness and smoothness that it can, with the minimum of effort, be kept as clean as the plates on which the family meals are served.

Fords porcelain lavatories are made up in so many distinct forms and designs that any shape of kitchen, work room, sleeping room or toilet can be fitted with little or no waste space. They can be installed in corners, recesses or along straight walls with equal economy in space and with equally good taste and appropriateness in design.

Fords porcelain lavatories contribute as much to the attractiveness of the home, office, store or factory as they do to personal convenience.

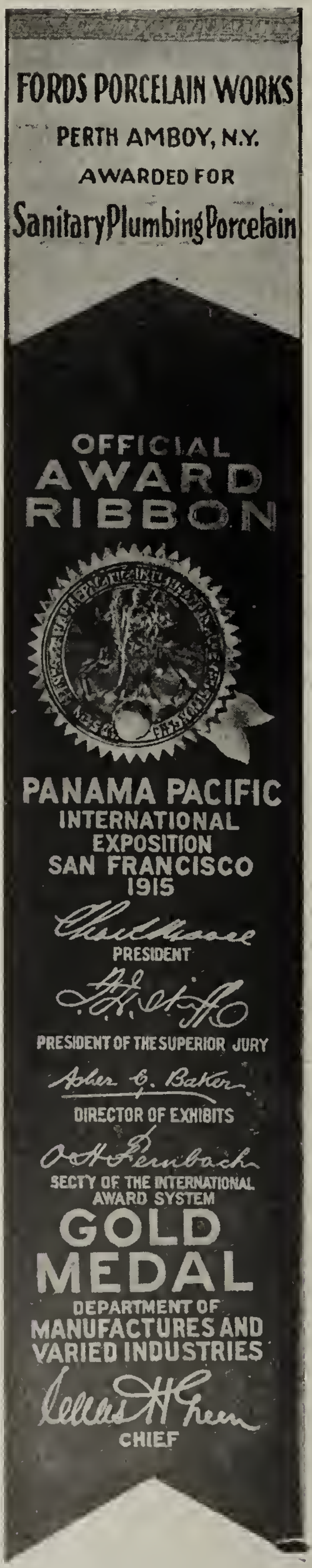
The success of Mr. Hansen, the man behind the Fords Works, is well deserved. Starting in a small way, a little more than a decade ago, he has by clean, clever business methods built up a tremendous business, which has grown with each successive year until now two great factories are required to produce the sanitary ware demanded by his patrons. We are pleased to picture these factories and some of their products, which find their way into homes and factories in nearly every state in the Union. As will be seen by their ad. on page 376, they make a full line of high-grade, low-cost sanitary ware for all purposes, but especially for factories and public places. Porcelain lavatories, urinal stalls, sinks and tubs, closet bowls, etc., are a sure preventive of the ills that come from unsanitary conditions, hence the constantly increasing demand for such ware.

The Fords Porcelain Works exhibited some of their wares at the Panama-Pacific Exposition in San Francisco and were awarded the first prize ribbon and gold medal, a trophy of which Mr. Hansen is justly very proud. He is also proud of the factories where this ware is produced. While a good long way from being an octogenarian, he is an optimist and a very companionable man who takes pleasure in meeting and greeting his fellow clayworkers to whom these factories are always open for inspection. Plant No. 1 is located at Fords, N. J., on the main line of the Lehigh Valley railroad. Plant No. 2 is located in Perth Amboy, but little more than an hours' ride from Broadway. Those who attend the next N. B. M. A. convention in New York City will find Mr. Hansen in the front ranks of the glad hand brigade. In the meantime, those wanting sanitary ware of any sort for their own plants are requested to correspond with the Fords Porcelain Works.

Sanitary ware is essentially a hand-made product, consequently the Fords plant employs hundreds of men, in whom Mr. Hansen takes a keen interest and has adopted and installed many "Safety First" appliances for the protection and welfare of the workmen. Coming up from the ranks of the laboring men, he knows what it is to do a hard day's work at the bench. He has been successful, not because he enjoys a monopoly in his line, but because of the fact that he is surrounding himself with the best of mechanics and improved equipment and manufactured articles people wanted and gave his customers courteous treatment and a square deal. The remarkable growth of the business may be seen from the following figures: During the first year (1907) the works supplied 5,250 familes with its wares. The second year, 11,600; the next year, 25,000, and so they have gone on each year, as a rule doubling their output, until in 1915 it totaled 65,000, and the present year will no doubt exceed that year by more than 50 per cent.

BRICK SELLING IN THE OLD DAYS.

It looks like a simple matter to go out and sell something, and it is if the people want it and are eager to buy. In that case, however, there is not much of the element of selling enters, because it is merely the supplying of a demand. That is the way it used to be in the brick business. People burned kilns of brick often to meet a demand already existing, or they burned them, trusting that a demand would grow up during the season which would utilize the amount produced. During those days, also, building was a little slow and erratic, and often required longer time between the planning and the finishing than in the present day.


FORDS PORCELAIN WORKS
PERTH AMBOY, N.Y.
AWARDED FOR
Sanitary Plumbing Porcelain

OFFICIAL
AWARD
RIBBON

PANAMA PACIFIC
INTERNATIONAL
EXPOSITION
SAN FRANCISCO
1915

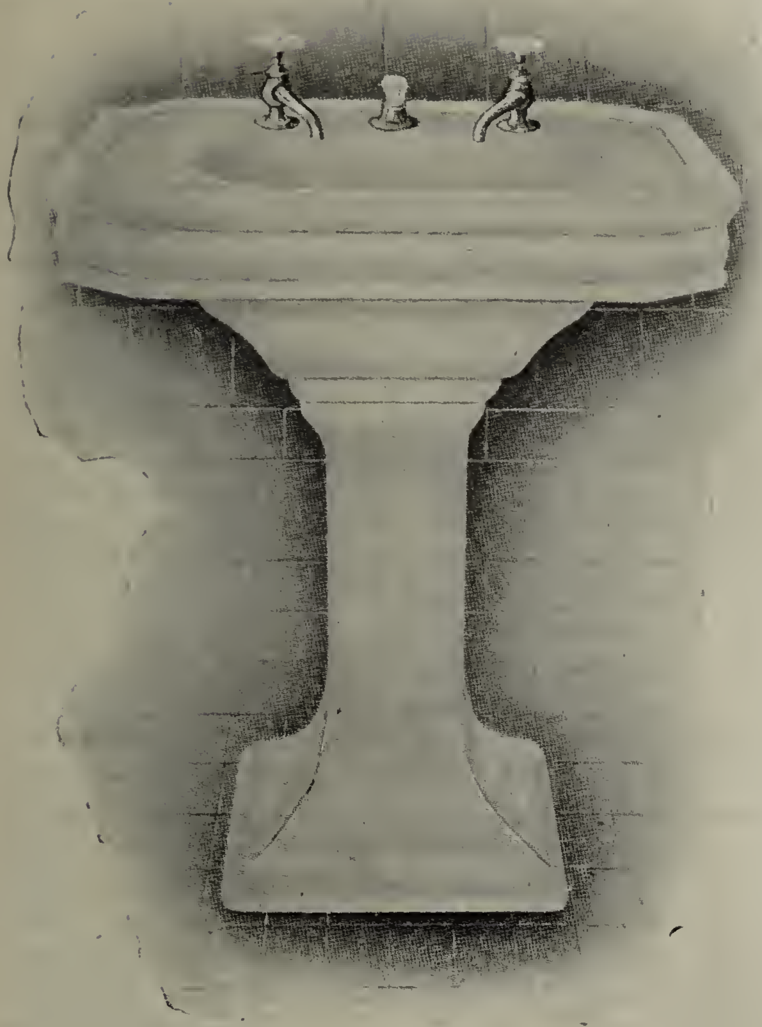
PRESIDENT

PRESIDENT OF THE SUPERIOR JURY
Asher C. Baker
DIRECTOR OF EXHIBITS
O. H. Fernbach
SECTY OF THE INTERNATIONAL AWARD SYSTEM
GOLD
MEDAL
DEPARTMENT OF
MANUFACTURES AND
VARIED INDUSTRIES

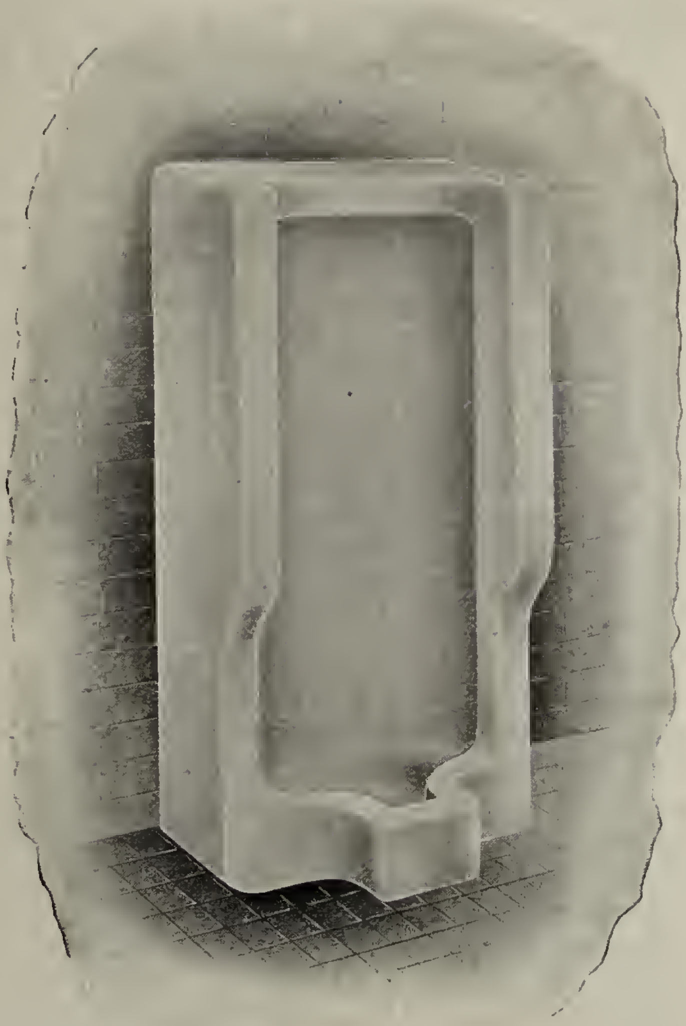
CHIEF

Gold Medal
Awarded to
Fords
Porcelain
Works

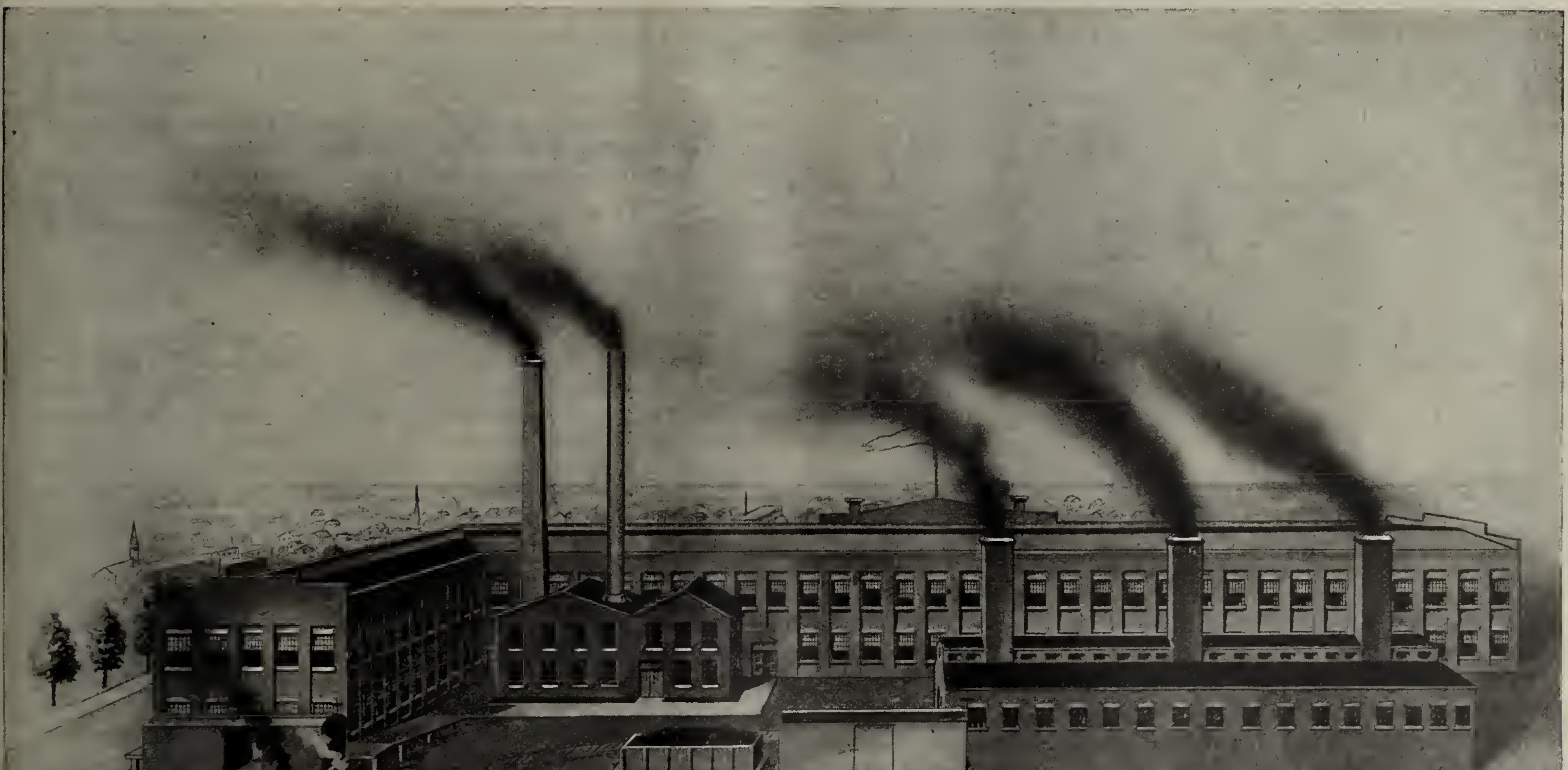
A Sanitary Sink of Simple Yet Pleasing Design.



Fords Porcelain Lavatory.



Fords Adjustable Urinal Stall.



Plant No. 2—Fords Porcelain Works, Perth Amboy, N. J.

Written for The Clay-Worker.

OBSERVATIONS OF A PACIFIC COAST CLAYWORKER TRAVELING EAST.

PART II.

IT IS A GREAT sight for a clayworker coming from the Pacific Northwest, where lumber is predominant, to see clay products used in nearly all building operations. If a clay manufacturer or his sales agent wishes to study the adaptability and the use of brick and hollow tile for residence purposes, he certainly could select Salt Lake City as a good example and field of study. The use of brick for residence facing purpose is very extensive and the effects obtained are very gratifying. For hollow tile walls they use hollow brick and a tile measuring 4x5x12, which they call 3-in-1 tile. This means it takes three brick for one tile. They also make another block 8x8x12, which replaces eleven common brick in wall construction.

Curiosity and the desire to obtain information made us step into the office of a real estate and building company, which exhibited a whole store front window of attractive residence pictures. From figures and statements given it can be said that brick and tile houses in Salt Lake City are not any more expensive than such built of frame construction, and according to the real estate agent the chance of selling brick houses is far better than frame houses.

The clay manufacturers in this section have developed the residence building of brick to a high plane, and are certainly reaping the benefit of a Build with Brick campaign. We presume that architects and designers deserve also a great deal of credit for the working out of the details, and the public in general is benefited.

While traveling eastward clay products are used more than in our own Pacific Northwest section, and in order to make comparison we hunted up a U. S. Geological Survey report about the Clayworking Industries of the Western States, and find that the far West is indeed sparsely represented as compared with Eastern States. Data from 1914:

States.	Number of Plants.	Total Value.
Washington	51	$1,809,491
Oregon	52	560,271
Idaho and Nevada	20	110,864
Montana	21	440,864
Utah	27	676,142
Colorado	62	1,082,685

If we take now from the same report some of our Eastern States, and also two of the Central Western States, we can get a fair idea of what the clayworking industry in the Northwestern Pacific States actually is:

States.	Number of Plants.	Total Value.
Ohio	543	$21,815,392
Pennsylvania	369	20,100,495
Illinois	263	12,538,374
Iowa	171	6,368,995
Missouri	98	6,074,340

After leaving Salt Lake City by the Scenic Route of the World, called the Denver & Rio Grande (D. R. G.), we pass Provo, Utah, where they are manufacturing fire brick and building brick. It is claimed there are some kaolin deposits in this section, but so far it has not been demonstrated that they have any commercial value. It is certainly an interesting trip, this Rocky mountain journey. We were gratified that we live on the Pacific coast and have to see "America first" before we get to the East. Horse curves, switchbacks, tunnels, deep valleys, tumultuous mountain streams, high peaks, snow-covered in midsummer. A lecturer on board the train, on the company's pay roll, told us all the interesting points to be passed next. To your left, Holy Cross mountains; next a mile tunnel, and we stopped at Tennessee Pass, 10,242 feet above sea level, and we crossed the Continental Divide and are now east of the Rockies. We mailed a souvenir postal card home and to The Clay-Worker from the highest postoffice in the United States, or "On top of the World," as our lecturer puts it.

Since we are on the eastern slope of the Rockies we are getting a feeling that we are getting East, for we are some 1,400 miles away from home already. This feeling was changed considerably in the latter part of the trip, when we heard people in New York and Philadelphia tell us that Ohio, like Cleveland and Cincinnati, or Chicago, was away out West. The downward travel along the eastern slope of the Rockies is just as interesting as the ascent on the western slope. After passing the Royal Gorge and the Hanging Bridge we come to Canyon City, where a large fire brick plant is located, and also large cement works. At Pueblo we make another stop; here are large iron and steel works, and the Standard Fire Brick Company has extensive works for the making of all classes of fire brick. After a short ride of four hours we reach the next stopping place—Denver, Col. SIWASH.

Written for The Clay-Worker.

NOTES FROM DIXIE LAND.

AN IMPORTANT deal has been closed at Nashville, Tenn., whereby the Nashville Pottery Company becomes the owner and operator of the Harley Pottery Company, one of the most representative concerns of its kind in the state. The active officers of the new concern are: W. H. Harley, vice president; W. H. Quarles, secretary; E. B. Bradley, treasurer. The plant has begun operation, and within a short time will have a full stock on hand.

I. C. Gerber, of Jackson, Miss., is building the $100,000 hotel at Greenwood, Miss., now approaching a state of completeness.

Prospects are that the clay industry in Marshall county, Kentucky, will develop considerably in the next few years, as another valuable clay deposit has just been found in that county by J. A. Torian, of Paducah, and A. J. Story, of Marshall county. The clay is of the ball variety. A Paducah, Ky., syndicate has been mining clay in that county for several months and is selling all of its output. The fine clay is expected to attract large factories to manufacture it.

A handsome church edifice, costing approximately $15,000, will be erected by local Greeks at Third street, north of Poplar, Memphis. A lot has been recently purchased, according to Chris Evans, of the Pantaze.

Plans for an addition to the Goodwyn Institute, Memphis, have been drawn by Architect John Gaisford. A 32-foot addition southward is contemplated. The seating capacity would be increased from 850 to 1,500. The plans have been under consideration for more than two years. The improvements will cost upwards of $100,000. Additions to the office, auditorium and library quarters are being planned.

Work is getting under way at Memphis on the new home of the Van Vleet-Mansfield Drug Company, at Gayosa avenue and Second street, Memphis, Tenn. The footings are being placed now. The building will be 84 feet by 150 feet, seven stories in height. C. O. Pfeil is the architect.

A handsome brick business house is to be erected on Madison avenue, at the corner of Maiden Lane, Memphis, Tenn., for Alston Boyd. This stands where the old Specht building stood for many years.

The contract has been let to S. Malkin, at Memphis, Tenn., for the new store building to be erected by Dave Hermon, at Vance avenue and Third street, to cost about $12,000. The plans were drawn by Architects Hanker and Cairns. The building will be 38 feet by 142 feet.

At Nashville, Tenn., Chas. Cohn will erect an apartment house fronting 190 feet, with a depth of 100 feet. It will be of mat brick and trimmed in terra cotta. The building will comprise a basement and three stories and will contain thirty apartments of from three to six rooms each.

The Indianola Brick and Tile Company, at Indianola, Miss., is turning out brick at this season, and is increasing the working force. DIXIE.

Written for The Clay-Worker.

HEARD IN NEW ENGLAND.

FROM ALL OVER the six states where brick are made come reports of a prosperous year. Much factory construction has been done and many dwellings have been erected, while in the large cities office buildings and similar structures have contributed to the general prosperity.

A great many factory buildings have been erected in Massachusetts and Connecticut, and in most instances brick, terra cotta or fire-proofing have entered extensively into the construction of the work. Cement men have made a good deal of news about what they have done during the season, but if their accomplishments are compared with those of the burned clay men, the comparison will be favorable to the latter. It is useless to attempt to deny this.

In Connecticut experiments with brick for roads and parts of roads are in progress, and thus far they seem suitable for withstanding the heaviest traffic. Some of the country roads are built with a strip of brick where the wheels of the heavy vehicles run. The experiments thus far are eminently satisfactory. Connecticut is endeavoring to discover some material that will warrant better service for the road surface than is possible with anything yet found, and burned clay seems most likely to meet the requirements of these tests.

Massachusetts is rushed with business and all over the commonwealth new buildings and additions to old ones are in progress. Ultimately they will be valuable additions to the business and factory structures, while the dwellings of brick are so numerous that they cannot be counted. High cost of other material has forced builders to consider brick, always with good results to the brick itself. Prices rule pretty high, but are no worse, relatively, than the cost of other building material, while permanency and fire-proof qualities make it much more economical to use. Massachusetts builders know this and are acting accordingly.

New Hampshire has enjoyed little short of a veritable boom the past summer, and its brick interests have profited with the rest. Never before has the demand for brick for all purposes been so active and never before have prices held up so strong all summer and into the fall. But good figures are obtainable now, and with the general shortage of supplies, which are all in close compass, the outlook is extremely firm, with an upward tendency noted in some instances.

Vermont has done a good business all the season now closing, and building has been done all over the state. The result is that the situation is satisfactory and the season closes with about everything gone from first hands, and it is difficult to secure promises of shipments in the future and at present prices. The tendency is sharply upward, and those yards which have any left are not permitting their stock to go without securing full prices. The market will probably go higher, makers say, before spring, and they see no reason for selling now, when they can hold their make just as well, waiting for the higher values, which most experts believe are inevitable.

Dyer Brothers, Greenfield, Mass., have operated their yards to as near capacity as circumstances permitted, and most of their sales have been at home, or near home. Admirably located for shipping purposes, they have, this year more than any other perhaps, been unable to help out builders in other localities. Greenfield is growing very rapidly, and the product of their yards was needed at home. They got good prices, and now, at the close of the season, they have few brick left for early orders next spring.

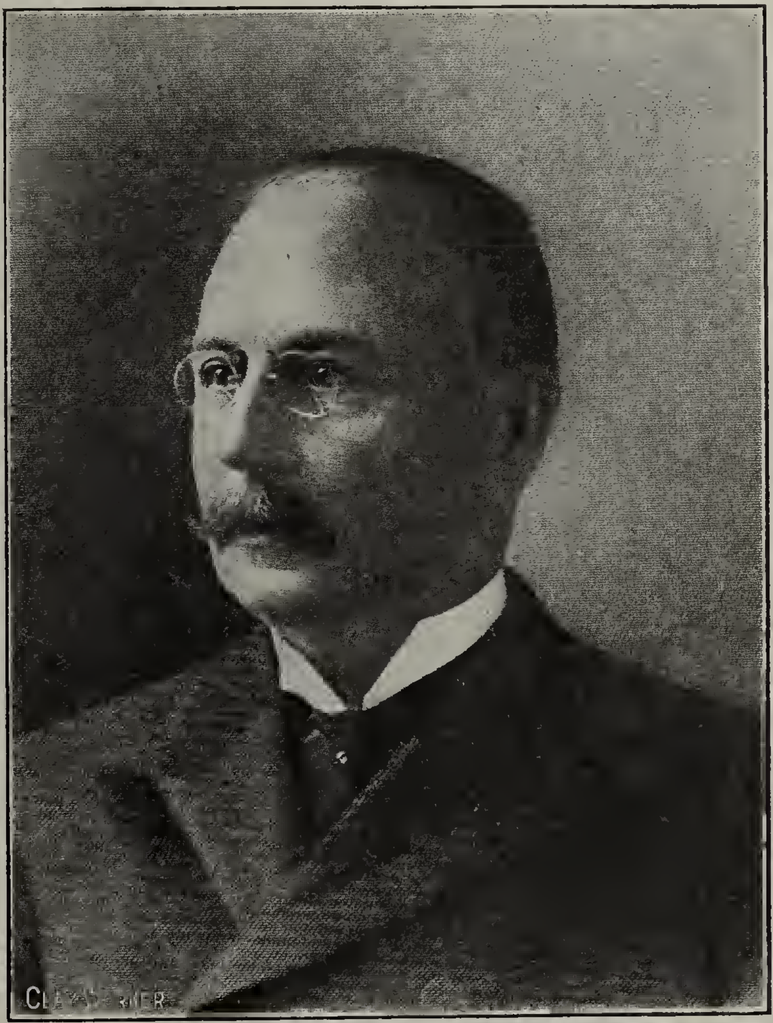
The Hampden Brick Company, Springfield, Mass., has managed to run close up to capacity all summer, even though labor scarcity was a factor early in the season. By hard work that was overcome, in part or wholly, and to-day the yards present a very busy scene as the season closes. All their product was required for home consumption, Springfield's development this year being very large.

The Berlin Brick Company, at Berlin, Conn., is finishing its last burning for the season, with prospect that it will all be sold out, so that virtually nothing will be left for distribution next spring. New Haven has taken the bulk of this firm's output at good prices. HIRAM.

OBITUARY.

Charles H. Frost, a Leading Brickmaker of the Pacific Coast, Dies After a Long Illness.

WHEN CHARLES H. FROST was laid to rest in a vault in the Inglewood Mausoleum at Los Angeles, Cal., October 11, he left behind him as a monument to his skill and industry some 30,000 buildings in southern California. For nearly forty years Mr. Frost was president of the Los Angeles Pressed Brick Company, one of the largest brickmaking concerns on the Pacific Coast. From its kilns material, brick, tile and terra cotta have been supplied for many of the largest buildings in California. Old-time brickmakers of Chicago will remember him personally, as he was engaged in the brick business there before he established himself in California.

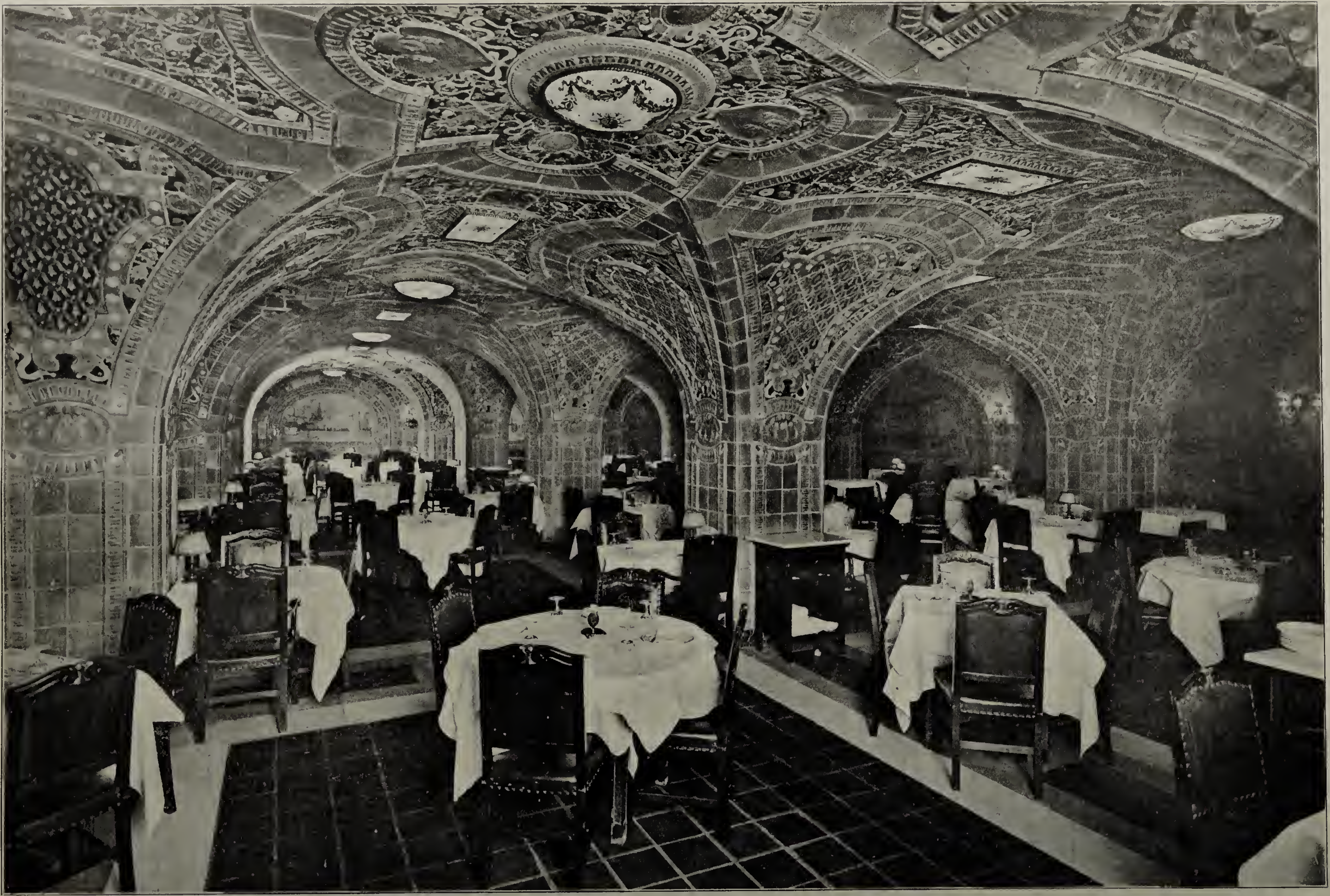


Charles H. Frost, Los Angeles, Cal.

Mr. Frost was born in Ithaca, N. Y., June 8, 1844. In 1862 his parents moved to Chicago, where his education was completed. When the war broke out he enlisted and served until 1866, when he returned to Chicago and re-established himself in business. Owing to failing health he went to California in 1887, when he organized the Los Angeles Pressed Brick Company and has been at the head of the same during the intervening years.

The business will be continued by his son, Howard Frost. The deceased was a Mason and a Shriner, and for many years was active in the councils of the National Brick Manufacturers' Association.

If you haven't had your say yet about preparedness for peace it's time to get into the game for everybody is taking a hand at it.



THE FAMOUS TERRA COTTA GRILL OF THE McALPIN HOTEL, NEW YORK CITY, WHERE THE CLAYWORKING CLAN WILL GATHER FOR THE THIRTY-FIRST N. B. M. A. CONVENTION MARCH 5 TO 10, 1917.

OFFICIAL ANNOUNCEMENT.

Thirty-first Annual Convention of the National Brick Manufacturers' Association and Allied Organizations to be Held at Hotel McAlpin, New York, March 5-10, 1917.

AFTER THIRTY YEARS of meandering among the cities of the nation, it has at last been decided to accept the insistent invitation of Father Knickerbock and hold the thirty-first annual convention of the National Brick Manufacturers' Association in New York City, now the largest city in the world.

It is fitting that the oldest and largest association of clayworkers in the world should meet in the world's greatest metropolis, which awaits with glad hands outstretched to bid a hearty welcome to the makers of the one indestructible building material of which the city everlasting has been builded.

McAlpin Hotel, Headquarters.

The convention will be held the week of March 5 to 10, 1917, in the famous McAlpin Hotel, which will afford unsurpassed facilities, being the largest hotel in the world, and this, too, is meet and proper, for it is predicted that the attendance at the convention will be the largest in the history of the association. The attractions of New York and its environs, its drives and parks, its statues and museums, art galleries and public institutions, its churches and cathedrals, its unequalled harbor and its several great suspension bridges, its tubes, subways and elevated railway, its great terminal stations, the largest in the world, and its many varied places of amusement, appeal irresistibly to every one.

For these reasons, New York is becoming the greatest convention city in the world. Mr. J. R. Young, secretary of the Convention Division of the Merchants' Association of New York, is authority for the statement that organizations of all kinds are more largely attended in New York City than anywhere else.

The Complete Home Show.

An unusual attraction convention week will be the Second American Complete Building Show, which will be held in the Grand Central Palace, which affords unequalled facilities for such exhibits. The show will be given under the direction of those who so successfully conducted the first show in Cleveland last winter. The co-operation of the brickmakers of the country is particularly desired, with a view of making the show of utmost value to the building brick industry.

All Allied Associations Will Meet There.

As in former years, the American Ceramic Society, the National Paving Brick Manufacturers' Association, the National Clay Machinery Association, the National Building Brick Bureau, and other allied associations will meet in New York at the same time, and will be afforded unsurpassed facilities for their deliberative sessions and other functions.

The clayworkers of New York and vicinity are heartily in accord with the convention idea, and promise to leave nothing undone to make the meeting most memorable. A program befitting the occasion will be arranged. Members desiring any particular feature of the business discussed at any of the sessions are requested to communicate with the Secretary in regard to same. Those desiring information as to requisite of membership, etc., will please write to the Secretary at Indianapolis, Ind.

THE EXECUTIVE COMMITTEE,
Charles J. Deckman, President.
Theo A. Randall, Secretary.

CANADIAN CLAYWORKERS TO MEET AT HAMILTON, ONT.

THE CANADIAN National Clay Products Association will hold its next annual convention Tuesday, Wednesday and Thursday, January 23, 24 and 25, 1917, at the Royal Connaught Hotel, Hamilton, Ont., Canada. A large attendance is anticipated, a splendid program is being arranged, and no detail will be left uncared for by the entertainment committee to make the coming convention the most enjoyable in the history of that organization.

Hotel McAlpin, New York City.

The present officers of the association are: President, J. Edward Frid, Hamilton; first vice-president, A. F. Greaves-Walkes, Toronto; second vice-president, Thomas Kennedy, Swansea; third vice-president, William Burgess, Todmorden; secretary-treasurer, Gordon C. Keith, Toronto; counselors, C. B. Lewis, Milton; D. A. Lochrie, Toronto; John S. McCannell, Milton; Ryland New, Hamilton; Herbert Desjardins, Montreal; Albert Neal, Kingston; Walter Clark, Corunna, and T. Graham, Inglewood; auditors, C. B. Lewis and William Burgess. The standing committees of the association are: Technical education, A. F. Greaves-Walkes, Charles A. Millar, F. Gibson, Joseph Keele, William Burgess, W. McCredie, J. E. Frid and Gordon C. Keith; committee of entertainment, D. A. Lochrie, J. E. Frid, C. A. Millar, J. S. McCannell, R. New, William Burgess and Gordon C. Keith.

Information relative to program, membership, etc., may be secured by addressing Secretary Gordon C. Keith, 32 Colborne street, Toronto, Ont., Canada.

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give a paper read at the 1915 convention of the American Ceramic Society.

NOTES ON THE COOLING OF VITRIFIED PIPE.

By S. C. Karsen.

THE following article represents a few experiments and observations upon the cooling of vitrified sewer pipe which the writer has made at different places and times under different weather conditions, and from clays which produced bodies of radically different nature, as to density and liability to cracking.

At one of our factories, manufacturing vitrified shale sewer pipe, considerable trouble was encountered in the cooling after burning. Pipe would check in kilns which were comparatively new, and under conditions which were favorable for safe cooling. Some scheme had to be devised, by which the cooling could be done rapidly and safely. With this object in view, a number of letters were sent to different members of our society, actively engaged in the manufacture of sewer pipe, asking for any data on cooling which they might be in position to give. I must admit that my inquiries brought very little results, most of the evidence obtained was of a contradictory nature. Whether it was a case of secrecy or simply that very little was known about the subject, is more than I can say. Several suggested methods would have required the constant attention of a ceramic chemist in a plant of our size. I desired a simple, concise method, which could be handled by men of low intelligence, and which required no attention after the kiln was launched in its cooling.

In order to fully understand the final changes made, a short description of the old method of cooling will not come amiss. I give here the system formerly used in cooling 24-inch double strength pipe, which was the largest pipe made and the most difficult to cool. The kiln was allowed to draw up the stack for about eighteen hours after being salted. Then the damper was dropped, and the stack shut off completely. The "back draft" plate was drawn back about 6 inches, and the cold air allowed to rush in through the stack flue. The fire holes are open, and reheating takes place as the heated air from the kiln passes over them. The kiln would stand thus for several hours. Then the fire holes were ashed up tightly, and a small hole made in the kiln door to allow the heat to escape. On the morning of the third day, the kiln was considered cool enough to be tapped. By tapping I mean tearing down the kiln door. The tapping was done slowly, a course of brick every hour or so, the door being completely down in twenty-four hours. On the morning of the fourth day, the fire holes were cleaned out; in the afternoon, the crown covers were removed, and the damper drawn that evening. On the morning of the fifth day, the kiln was ready to draw.

As you will note, from the morning of the third day, when the door was tapped, ample precautions were taken to insure safe cooling. Hence the point at which the air checking took place was between the time when the kiln was finished and the time the door was tapped. After much thought on the subject, I set up the following conditions which an ideal cooling system had to meet to give results:

First. Prevent sudden changes in the kiln atmosphere after the kiln has commenced cooling; that is, sudden fluctuations of the draft, sudden cooling and reheating due to any agency.

Second. The cooling must be uniform over the entire kiln. No one section should cool faster than another, all should proceed evenly and uniformly, much in the same way as the original burning had taken place.

Third. Above all things, the system must be simple and fool-proof. By this, I mean that the cooling operation must be done quickly and simply, so that labor of poor quality could handle it easily.

I felt my system simply had to meet these conditions to prove successful. Let us now examine the old method to see how far short it fell of these ideal conditions. As stated, the kiln was allowed to stand for fully eighteen hours without being touched in any way. During this entire period, it was drawing up a continuously cooling stack. As the stock cooled, its suction necessarily decreased, and this in itself would finally lead to counter currents and cross-currents of air in the kiln. Moreover, the fact that the fire holes were allowed to be exposed for so long a period laid the kiln open to wind and sudden climatic changes which often prove disastrous. The draft is reversed at a late period in the cooling, when the kiln is becoming especially sensitive to sudden changes. The fire arches commence to reheat, as do the bottom pipe in the kiln, and this would surely prove dangerous to sensitive ware. Finally, and worst of all, after the fire holes are closed, we attempt to remove the heated air at a small opening in the door. It is obvious that uniform cooling cannot be obtained by attempting to remove the heat at one small opening. The ware near the door would cool very rapidly, while that farther in the kiln would remain hot for a long period. When the door was tapped, cooling would proceed more rapidly, and this still hot ware would check.

The system in use evidently violated every condition which I considered as necessary for good cooling. I decided, therefore, to make the following changes:

First. Drop the damper and cut off the draft as soon after the salting as feasible. A certain amount of burning fuel remains after the salting is complete, which prevents immediate reversal of the draft, as the products of combustion will reduce and discolor the ware, unless we allow the fuel to burn up completely. For this, I found that about two hours was enough.

Second. Make the back draft opening about 6 inches by 24 inches. This is merely a nominal figure and of no great importance, as I will point out later.

Third. Immediately on reversing the draft, close the fire holes tightly, either ashing or mudding them. Under such conditions, the kiln is perfectly tight.

Fourth. Remove the heat through the crown holes. Cooling holes should be cut in the crown, about 8 inches square, placed at a point directly between the bags. Covers should be provided for these, as well as for the center crown hole. By moving these covers, we can remove the heat at any rate of speed.

Considerable experimental work was necessary to determine just the right sized opening to obtain the best results. If the openings were made too large, the ware would cool too rapidly, and consequently air check. If, on the other hand, the openings be made too small, the ware would not cool rapidly enough, would be hot when tapped, and hence become checked. Smaller ware could be cooled more rapidly than the larger sizes, and a considerable amount of experimental work was necessary before I finally arrived at the proper sized openings required. Table I gives the method complete, with the size of openings in use at one of our factories in Ohio. At one of our other plants these openings were made considerably larger, and in general the size is determined by local conditions.

The points in favor of the system as outlined are numerous:

By immediate reversal of the draft, we do away with unnecessary air currents and drafts, or rather, cause them to occur at a period when the ware is not sensitive. When the cooling has progressed for some little time, the ware becomes more sensitive to fluctuations of kiln atmosphere and thus air check more easily.

By closing the fire holes tight, we prevent air checking due to sudden atmosphere and climatic changes. Furthermore, we remove the heat all at one point and prevent leakages at the fire holes.

By cooling from the top of the kiln, we are cooling with nature instead of against it. The heated air rises naturally, and hence we are aided by this pressure in the removal of the heat. Furthermore, the cooling of the air is uniformly distributed by these openings over the entire kiln. The cold air passes in through the stack flue, up through the bottom to the crown, and is removed there evenly at a speed to suit the operator. In this way, cooling is controlled and concentrated at one point, giving perfect control. The kiln, tightly closed, can only cool through the crown openings, which are adjusted to suit conditions. The cooling can be accomplished as rapidly or as slowly as desired and is always under complete control.

Table I—Cooling System.

Diam. Pipe Inches	Until Damper Dropped Hours	Until Fire Holes Closed Hours	Size of Opening Back Draft Inches	Size of Opening Center Side Crown Holes Inches	Until Door Tapped Hours	Door Down Hours	Kiln Ready to Draw Hours
6-12	2	not closed	6 by 42	not opened	24	12	72
12-18	2	2	6 by 24	¼ by 8	48	24	96
18-20	2	2	6 by 24	½ by 8	48	24	96
20-22-24	2	2	6 by 24	¾ by 8	72	24	120

The system is simple, the entire operation is performed at one time. The kiln is not touched from the time the damper is dropped, until the kiln door is tapped. The method is completely under control at all times, which is of prime importance for satisfactory cooling. Using the cooling method as outlined, good results should be obtained. A few other conditions affect safe cooling, and these must be thoroughly understood.

The Effects of a Dirty Kiln Bottom. Very often, where a plant is operated to the full kiln capacity of the factory, the kilns are allowed to stand from one to three years without having the checker bottom removed and cleaned. As a result, material will accumulate in the feather flues over the holes leading into the main flues, often completely closing many of them. The effect of this is that different parts of the kiln cool at different speeds. Where the holes are open the cooling takes place under normal conditions, where the holes are closed, cooling is retarded, and as a result, hot spots are left in the kiln. When the door is tapped these spots will cool down rapidly and produce air checking.

The use of the cooling system has proven the above statements to my entire satisfaction, and has prolonged the life of a bottom in the following way: Suppose a kiln has been cooled regularly for a period of nine months or so without a sign of air checking. Then the kiln commences to show a few air-checked pipes. This would indicate that the bottom was commencing to fill up, and that it was time to cool the kiln a trifle slower. By cutting down the size of the openings the kiln would be cooled a day longer, which will help for a while. The kiln will commence to show signs of air checking again as the bottom becomes more filled up. Smaller wares, which are easier to cool and less likely to check, would now be set in this kiln. If the ware still continues to check, no other course remains except the removal of the bottom and a thorough cleaning of the feather flues. Whenever this was done, air checking would cease completely, and the largest ware could be cooled safely. This proved conclusively how vital a clean bottom is for efficient cooling. It also shows what nice control the system gives us, and how it helps increase the life of a kiln bottom to a considerable extent.

The Effect of the Type of Flue System. It is reasonable to suppose that a flue system which will give an even distribution of heat in burning will also produce even and uniform cooling. In other words, cooling, a direct antithesis of burning, is more or less subject to the same laws by which flue openings are regulated. Extreme care should be used in the cooling of kilns with old fashioned flue systems. I cannot speak too strongly against the use of the so-called "ring flue" system. In this system a circular flue is completely around the kiln, next to the walls. From this, one center flue connecting into the ring flue passes to the stack. One small opening leads directly into this stack flue, and is in the center of the kiln. Openings leading into the ring flue are placed between the bags. This is one of the poorest flue systems I have ever encountered, so far as both burning and cooling are concerned. I am using this particular system as an example, because I have found its use prevalent in the sewer pipe districts of Ohio and to a small extent in Michigan.

Cold air is drawn upwards, principally around the outside of the kiln with very little at the center, and this invariably causes unequal cooling and air-checked ware. On tearing out this flue system and replacing with the radiating flue system or some similar system, no further trouble was encountered. Too much care cannot be used in the selection of a bottom for kilns, especially in a region where the clay is sensitive in cooling. Any system, by which reasonable heat distribution is obtained in burning, should give good results in cooling.

The Effect of the Back Draft Opening. With the use of the updraft system of cooling, I find that the opening at the stack used to admit the cold air may be of any size. The influx of air is controlled by the top covers. The more heated air we release at the crown the greater will be the suction at the back draft plate. It is obvious that we must not choke this opening, as we would thus be working towards a vacuum and be retarding the cooling. But we have nothing to fear from making the opening too large, as the crown covers take care of the supply. Care should be used to keep this opening large enough.

For the information of those who may not know what I mean by back draft opening, I wish to state that the flue at the stack is left exposed directly at the point where it enters the stack. A plate is used to cover this opening, and this, of course, should be kept tight in burning, as it will check the stack draft otherwise. In cooling, the damper is dropped, and the stack draft is thus cut off. Then the plate just mentioned is drawn back, and cold air is thus admitted into the stack flue and drawn into the kiln. I use an opening 6 inches by 24 inches, but it may be made larger if desired, as the amount of air drawn in is regulated by the crown openings.

Cooling, of course, is more or less affected by poor kiln walls, and care should be taken to keep the walls in as good shape as is practical. Strong winds can very readily air check a kiln of ware, if the walls be at all leaky.

Period of Greatest Danger in Cooling. I have found statements by many prominent authorities, leading to the conclusion that the period of greatest danger in cooling is at a time when the ware is just turning from red to black. Acting on this theory, I attempted to open the crown covers more widely the first six hours of cooling and cutting down on the opening, as the so-called danger point was approached. After considerable experimenting, I finally was forced to the conclusion that it was just as dangerous to hurry a kiln at the first part of the cooling as at the latter part. It is also possible to air check a kiln of ware, after the same is perfectly black. It has been my experience, therefore, that no definite danger period can be assumed, and that it is necessary to use a uniform rate of cooling for good results.

In conclusion, I wish to say that the system I have just outlined is not exactly original with me. I have found it in use to a greater or less extent and in a very haphazard fashion in different factories through the East. However, very few of the burners use the same methods or have a very definite system, the element of chance entering very largely into the operation. I feel confident, however, that the cooling, if handled in the way I have outlined, would be under complete control. I have used it in factories manufacturing ware from both fire clay and shale, and in sections where the clay was highly calcareous, being neither shale nor fire clay, and invariably obtained good results.

Discussion.

Mr. Lovejoy: Mr. Karzen's paper brings out some points that interest me very much. We have always held that it was perfectly safe to cool rapidly at the early stage of the cooling, and slowly during the low temperature or so-called danger period, as Mr. Karzen puts it. In wares other than sewer pipe, however, after we get below this, we never consider it any danger. Of course, that stage is different in glazed ware; and we may have checking occur months after it comes from the kiln; but in common ware there is no danger after it gets below red. It would be interesting to know whether it is true that it is necessary to cool equally slowly throughout. We have held to the contrary.

Mr. McDougal: This paper recalls something which quite startled a class from the university when, sometime in 1910, we visited a sewer-pipe plant in Haydenville, Ohio. As we came into the yard we saw kiln men tearing down the door and pulling the fire from a kiln of sewer pipe which had just been burned off at a white heat of about cone 9. As I remember it, water was thrown into the fire boxes, both for the purpose of cooling and to make more friable and more easily extricated the clinker that remained. Although the stack damper had been closed, the crown holes were open. After this cooling by radiation to a dull red heat, the door was roughly rebuilt, the crown holes closed and the stack damper partly opened. They claim that they had no trouble with air checking so long as the usual precautions were observed after the dull red stage had been reached.

Mr. Lovejoy: We have the practice of the National Sewer-Pipe Company. What is the practice of the American?

Mr. Karzen: Mr. Lovejoy errs when he considers either Mr. McDougal's version or mine as a particular of any one company. It depends entirely upon the nature of the clay. The clay that Mr. McDougal refers to is a No. 2 fire clay in use by the National Fireproofing Co. A clay of this type is a safe cooling proposition, and it would be a very difficult matter to air-check the same. Our company has several factories manufacturing ware from No. 2 fire clay, and they never have any trouble in cooling and consequently use no particular method. Where we use shale as the basis of our mix we have quite a different proposition. Hence some definite scheme must be used to cool the ware safely. I hope that no one will consider this article as the practice of a certain company. The nature of the clay itself must determine the method of handling. A perfectly safe cooling clay needs no particular method.

Mr. A. F. Greaves-Walker: I want to ask Mr. Karzen how the American Sewer Pipe Company finds any money in taking an extra day to cool off the kiln because they do not want to take the trouble to clean the bottom? Why do they not put in bottoms that do not require absolute tearing out and that can be cleaned for two or three dollars at a time? In most plants the trouble is in shortage of kiln capacity. If you take a day longer to cool each kiln you reduce the capacity of the plant, and most people know that capacity means dividends.

Mr. Karzen: The reason for not tearing out a bottom would be because we did not want to lay the kiln off. You have a regular cycle in setting ware. When it comes to the turn of the one doing the air-checking, it necessitates laying the kiln off three weeks, whereas the extra day we give to cooling that one kiln hardly affects the production at all. On the other hand, the two weeks laying off to put in the new bottom is a serious proposition when running to kiln capacity. As to cleaning without tearing the complete bottom out, it is impossible; you have to tear the bottom out completely.

Mr. Greaves-Walker: I want to say to Mr. Karzen that I have had sewer pipe kilns that could be cleaned at any time for two or three dollars without touching the bottom. The dirt could be gotten out without doing so. Why take two weeks then? If the American Sewer Pipe Company cannot do it in less time, it seems to me there is a chance for improvement in their work.

Mr. Lovejoy: Mr. Walker, when the bottom is cleaned so easily is it fully perforated?

Mr. Greaves-Walker: Yes, by using a center kiln and having the secondary flues all slope toward the center flue and by having a manhole on the outside where a man could take the refuse from.

Mr. Bowman: I should like to ask where the air-checking takes place mostly; at the top or at the bottom?

Mr. Karzen: At the bottom. The ware with which we have most of the trouble is the bottom pipe. I have seen kilns that were checked from top to bottom, but it is not the usual thing.

Mr. Bowman: I noticed in the description of the cooling that you plastered up the kiln and put down the damper and opened up the top of the kiln, cooling from the top. Why did you put down the damper? If you closed up the fire holes you could not have any draft from them and by letting the heat out of the stack and opening up the top stacks you might induce the draft to go down through the kiln and hold the bottom temperature near to that of the top and in that way prevent dunting. That was the experience I had twenty-five years ago in cooling from an opening in the top of the kiln. We had an opening in the center of the crown of the kiln about 18 inches, and as soon as the kiln was fired off we waited for a few hours (I do not know exactly how long) until the fuel in the fire holes burned out, then we opened the hole in the top of the kiln, but did not close the damper to the main stack of the kiln, but permitted the heat to go out that way. We never experienced dunting, but this may have been due to the fact that our pipes were made of a fire clay body.

Mr. Karzen: May I ask how long it took to cool off?

Mr. Bowman: I think we used to take three days to cool off.

Mr. Karzen: It is necessary to drop the damper as I have already pointed out, a continuously cooling stack means a continually decreasing suction and consequently will eventually lead to fluctuating air currents in the kiln atmosphere. With a safe cooling clay this will have no effect. With a tender clay it will invariably lead to air-checked ware. The heat must be removed at one point to give perfect control.

CLEVELAND BRICK COMPANIES CONSOLIDATE.

One of the biggest deals that has taken place in the clayworking world for some time is the consolidation of four of the largest brick companies in Cleveland, Ohio, embracing ten plants. The concerns merged in the one big company, which will be known as the Barkwill-Farr Brick Company, are The Barkwill Brick Company, the American Building Brick Company, the Cuyahoga Brick & Shale Brick Company and the Farr Brick Company. The new concern is capitalized at $4,000,000.00, and 25 per cent. of the stock will be offered to the public. The entire issue is common stock and no mortgage or debt of any kind exists. The combined capacity of the ten plants is 1,000,000 brick and 60,000 5x8 tile per day. The officers of the company are: President, Ernest S. Barkwill; vice-president, Robert J. Dawson; treasurer, Lawrence B. Koblitz; secretary, John J. Jackson; general manager, Herbert J. Farr, and chairman of board, Ernest W. Farr. Robert C. Mitchell, formerly in charge of sales for the Farr Brick Company, will be associated with the new company as sales manager. In a statement issued by the Barkwill-Farr Company, they say:

"The rapidly increasing production cost of building brick and construction tile and the excessive cartage, by reason of overlapping deliveries of same, brought us to the realization that the best interests of our customers, and the public in general, would be better served by the action we have taken.

"We, jointly and individually, wish to express to one and all our friends and patrons, our great appreciation for the loyal support always given us, and to earnestly request that you will permit the new organization to serve you in the future as we have done in the past.

"It is only by such co-operation we may hope to succeed and prove a real and lasting benefit to the building interests."

The offices of the company will be located at 222 Leader-News Building, Cleveland.

ROAD BUILDERS ASSOCIATION ELECTION TO BE HELD IN NOVEMBER.

The annual meeting of the American Road Builders' Association will be held November 3, at the Automobile Club of America, 247 West 54th street, New York, N. Y. The sessions will commence at 2 p. m. Aside from a meeting of the board of directors and reports of officers and committees, the principal interest of the meeting will center in the election of officers for the year 1916-1917. This is now being conducted by means of a mail ballot, but the polls will not close until 4 p. m. on the day of the meeting.

In the evening the annual "get-together" dinner will be held in the grill room of the Automobile Club of America. This will be attended by the members of the association and their friends and the organization extends a cordial invitation to all who are interested in the work of the American Road Builders Association, or in the good roads movement in general, to be present. A program is being prepared and nothing will be left undone to make the occasion most enjoyable and instructive. The result of the election will be announced during the dinner. All who desire to attend are asked to notify the secretary of the association, 150 Nassau street, New York, N. Y., as far in advance as possible.

ANNUAL CONVENTION OF AMERICAN ROAD BUILDERS WILL MEET IN BOSTON.

THE Fourteenth Annual Convention of the American Road Builders' Association will be held in Mechanics Building, Boston, Massachusetts, during the week beginning February 5, 1917. The program, which is in course of preparation, will include papers and discussions on subjects connected with road and bridge building and street paving by the foremost authorities of the United States and Canada.

In connection with the convention, and in the same building, will be held the eighth National Good Roads Show. This exposition will include exhibits by leading manufacturers in the United States of the machinery and materials used in road and paving construction and maintenance.

This exhibition, which has been a feature of the American Road Builders' Association conventions for a number of years, has increased in size and interest year after year. The coming exhibition takes on added importance on account of the enormous sum of money appropriated under the recently enacted Federal Aid Law and the additional large sums to be expended for road building by the various states and smaller units of government.

Mechanics Building, in which the Convention and Good Roads Show will be held, is admirably situated and fully equipped for the purpose. It is located on Huntington avenue, within convenient distance of the leading hotels and business district of Boston. The building is well lighted and heated, and is thoroughly modern in its appointments. It contains ample space for practically any number of exhibits, and is adaptable to exhibits of any size, as the floor plans just published indicate.

The management announces that the services of Mr. H. G. McConnaughy have been secured as director of exhibits. Mr. McConnaughy has had many years' experience in this line of work and is well known in connection with the management of the exhibitions held under the auspices of the American Electric Railway Manufacturers Association.

PEACEFUL POTTERY BECOMES FACTORY OF WAR IMPLEMENTS.

The world-famed national porcelain factory at Sevres, France, has been transformed into part of the huge war machine. Instead of making those dainty and fragile statuettes and vases, which are the wonder of art collectors, it is turning out "poteries de guerre," or earthenware retorts and cauldrons for manufacturing asphyxiating gas and for all the various chemical processes of producing high explosives. Even the famous artists whose names are associated with the delicate coloring of Sevres porcelain, are now exercising their art in enameling these huge retorts so as to make them more resistant to the acids and chemicals used in the war processes.

Sevres has gone through a complete transformation, and is today furnishing thousands of receptacles of all sorts in which powder, explosives and gases of all sorts are manufactured and stored. With a staff less than half its usual strength, the production of Sevres is five times as great today as it was before the war. And besides the great quantity of its war output, the quality of its work is making it a sort of expert school for the engineers of the various powder factories. The chief workers of these factories now come to Sevres to study the chemical methods employed in hardening clays and making them more resistent to high temperature. A huge new furnace, three times the size of any heretofore used, is now being built for the manufacture of retorts of specially large dimensions. And the change from an art basis to an industrial basis has also necessitated the building of vast new workrooms, with drying rooms, etc.

The employes, as well as the owners of this famous national institution, founded for the development of ceramic art, were able to join with French industry when the war called for united efforts of national defense.

A NEW RECORDING THERMOMETER.

THE BROWN Instrument Company, of Philadelphia, is placing on the market a new type of recording thermometer for temperatures to 800 degrees Fahr., or 425 degrees Cent., which embraces a number of original features. This instrument operates on the principle of the expansion of gas with change in temperature. A bulb of copper containing nitrogen gas under pressure is connected to a recording instrument by a small copper tube protected by flexible steel tubing.

The recording instrument has a helical spring, somewhat similar to that used in pressure gauges, and the expansion of the gas in the bulb exerts pressure which is conveyed by the capillary tube to the helix which expands proportionately. This helix is directly connected to a recording arm which marks on the record chart.

The Brown Indicating Thermometer.

The Brown Recording Thermometer.

This type of instrument can be furnished with tubing as long as 100 feet, if required, so that the recording gauge can be placed as much as 100 feet distant from the point where the temperature is measured. This permits of its application in numerous processes where it is desirable to keep a constant record of the temperature on a chart.

Some of the improved features in this new type of instrument follow:

The Seth Thomas clock, which revolves the chart, is mounted directly on the front plate on which the chart revolves, which insures alignment of the clock and chart plate.

The clips which hold the chart in position are mounted on the door, so that when the door is swung aside these clips are automatically swung away from the chart, permitting its easy replacement without interference.

A device is furnished which raises the chart pen from the chart automatically when the door is opened, and frees the pen automatically when the door is closed.

This instrument is made also in indicating form, where desired, to indicate the temperature on a dial instead of recording it on a chart. It is furnished with a number of different types of bulbs, either with threaded connection for insertion in mains and pipes, or with lead coating to withstand chemicals and acids.

They can be used to advantage to record the temperature of the waste heat from the kilns or in the dryer tunnels. A special bulb can be furnished, where desired, to give the average temperature in a dryer tunnel instead of at one point only.

PIONEER BRICK WORK.

While we have improved the process of manufacturing and burning brick until the product of an up-to-date kiln today is much superior to that of the old days of handcraft and simple burning, the fact still remains that even those pioneer hand-made brick furnished a product superior to any other building material. We are reminded of this every now and then by coming across something of historic interest in connection with the brick making industry. When down at New Orleans they demolished that old historic St. Louis Hotel, which had been standing for three quarters of a century, it was found that some of the three-foot brick walls were very difficult to break down and wreck. There was not only demonstration in this instance of the lasting qualities of brick and the solidity of proper brick construction, but there was another interesting product unearthed and that was some circular clay tiles of old time make that was studied with much interest and curiosity. In another instance the writer was at a picture show when under the subject of "See America First" there was shown a lot of the coast country about Salem, Mass., and among the things shown was the oldest lighthouse in the United States, which was constructed of brick brought across from England in the Colonial days as ballast in ships.

CLAY MINING INDUSTRY.

According to the United States geological survey, department of the interior, the war in Europe has caused a shortage in high-grade fire clay formerly imported from Germany, which has seriously affected the manufacture of crucibles and lead pencils in this country.

Efforts have been successful, however, in locating a domestic supply of clays suitable for use in these industries in Arkansas, Illinois, Missouri and Ohio.

Clay mining in 1915 was more prosperous, especially during the latter part of the year, than in 1914, the quantity of clay marketed being 2,362,954 short tons, valued at $3,971,941, an increase of 153,094 tons in quantity and $215,373 in value over 1914.

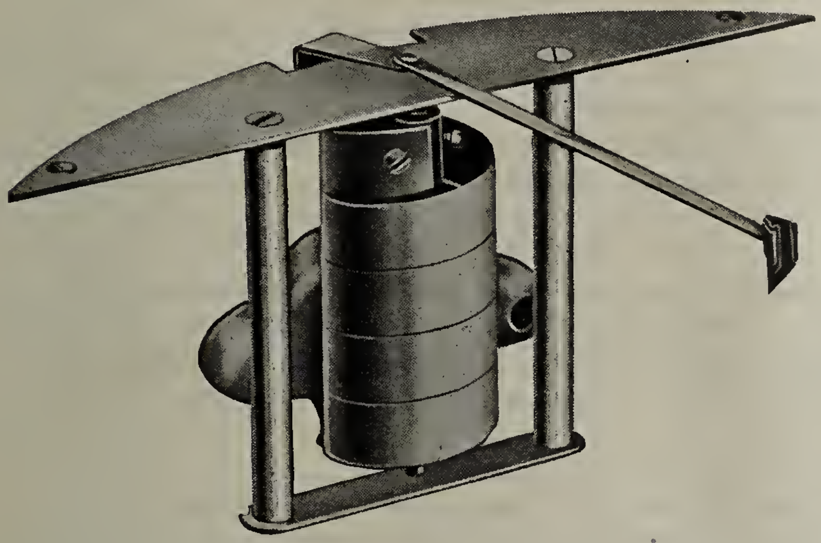
Fire clay is the most important variety of clay, 1,570,481 tons being reported for 1915, valued at $2,361,482, an increase of 161,014 tons and $214,205 over 1914.

There were 28,031 tons of domestic kaolin, the purest form of clay, marketed in 1915, valued at $241,520, a small decrease from 1914.

USE OF BRICK IN NEW YORK.

If any one is afraid that the use of brick in New York is declining, he needs but to move about the city to dispel any fears he may have of that sort. Much has been said about cement construction in recent years, but aside from stables and some factory buildings the work of the cement man doesn't show very strongly. Brick is still the favorite construction material in New York and is used when all else is rejected.

The kind of brick has changed. Where formerly only the old-time red brick, striped with white mortar between, was used, now the surfaces are all of the tapestry or colonial type, mostly rough and frequently set with deep joints. All those which are used are generally thus set. Furthermore, brick form but a relatively small portion of the burned clay used in building construction within the limits of the greater city. Fire-proofing is used in every large building put up, which includes floors and partitions. And the outside of these structures is composed of terra cotta and tile, in some instances. Architectural terra cotta is as common as wood used to be. And the more it is used the better those who use it seem to like it. The character and designs are so appealing in these times that any style desired can be produced. It is used upon every New York building erected now.



The Helical Spring and Recording Arm.

These are but few of the uses to which burned clay is put in New York now. Everywhere it is the same—burned clay, and plenty of it. That seems to be the order of builders.

A few days ago what was apparently some very handsome granite was seen lying beside a building where operations were ready for the first course of stone. But it wasn't granite at all. It was terra cotta made to imitate granite so closely that even experts will be deceived when the blocks are in the wall. In fact, some of the supposed stone buildings of the past two or three years will be found, upon closer examination, to be burned clay. And the builders, in using this material, have insured absolute permanency regardless of the conditions which may some time surround the structure.

Real granite would break into thousands of pieces and fail if water were poured upon it when hot, as in case of a fire, but no fire hot enough to injure the burned clay imitation can ever be obtained through the burning of buildings in that vicinity. Insurance charges go down in consequence as safety assurance goes up.

These incidents are cited to show those who may feel disposed to become discouraged over the use of cement that the cement people are not having things their own way unimpeded by the competition of a better material. If burned clay is the principal structural material in the largest city in the world it ought to be good enough for other cities that want to put up buildings as nearly fire-proof as they can. Clay will do the work, but nothing else will perform the service so satisfactorily.

MOROS TO LEARN HOW TO MANUFACTURE TILE.

According to press reports from Manila, the latest step in the advancement of the Moro is a plan to introduce among these Mohammendans the art of tile manufacture. A number of Japanese tile makers are to be imported into the Moro country to settle near schools and settlements for at least six months. They will open tile making schools and it is expected that the Moros will soon be able to manufacture roofing tiles as cheaply as the work is done in Java.

The Moros, like other Philippine tribes, use straw and thatch as a roofing material. It is not costly but it is highly inflammable and is an invitation to destructive fires. Tiles will eliminate the fire danger and not increase the cost of construction.

"PRODUCER GAS WILL SOLVE THE BURNING QUESTION."

The above is the opinion of a practical burner of many years' experience, as will be seen by the accompanying letter from Anton Vogt, who is a recognized authority on burning clay wares. The Underwood system is offered to the trade by the Manufacturers' Equipment Company, see ad on page 369 of this issue, and they naturally are much gratified to have such a strong testimonial from one so well qualified to speak on the subject. They have similar letters from others who have investigated the Underwood System, which they will be pleased to submit to anyone desiring further information.

Cannelton, Indiana, Sept. 25, 1916.

The Manufacturers Equipment Co.,
Dayton, Ohio.

Gentlemen:

Yours of the 20th instant forwarded to me here to hand and noted. Yes, I have seen the Underwood Patented Producer Gas Burning System, at the U. S. Brick Co.'s plant at Tell City, Indiana, in practical operation and I can say honestly, that the Underwood System of burning brick with producer gas, will solve the "Burning Question." It's the "best," the most perfect burning system of any system I have seen in operation or handled myself in my thirty years of American practice in burning clayware and clayworkers, installing the Underwood Producer Gas Burning System in their kilns will save time and fuel and improve the quality of their products.

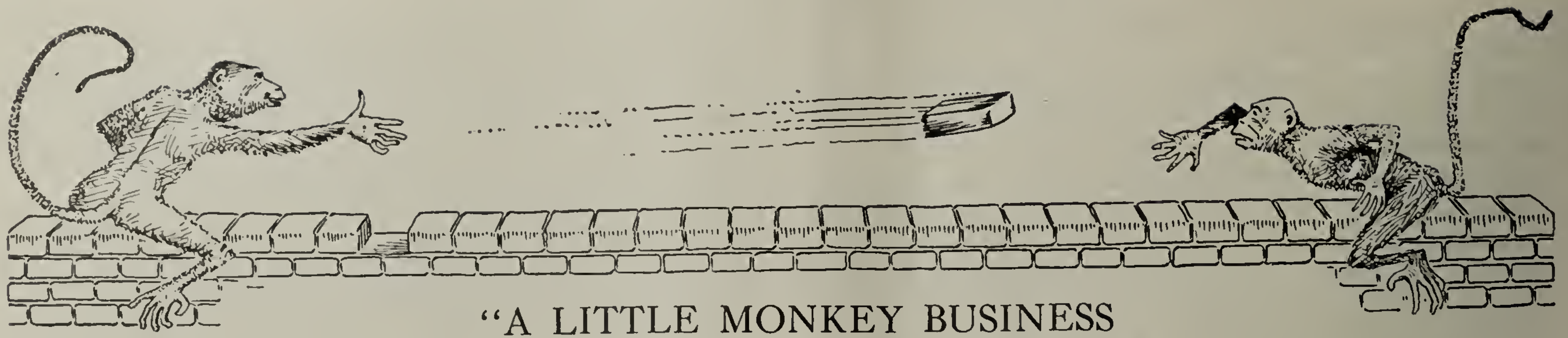
Wishing you success which the system deserves, I am

Yours sincerely,
ANTON VOGT.

Between Seasons.

Of course these autumn days are grand
But melancholy seem.
It's most too cold for comfort, and
It's most too warm for steam.

It is quite the fashion now to break all previous records in our export trade. Next in order should be some record breaking in the building trade.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Our Sawed-Off Sermon.

There is a large and constantly increasing demand for a device that will compel a man to shut up when he has said enough.

A Questionable Compliment.

Molly—George told me I sang like his pet bird. That is quite a compliment, don't you think?

Ethel—Not when you know his bird is a parrot!

Too Cruel.

"I can't find any old clothes to put on the scarecrow," said Farmer Corntossel.

"You might use some of the fancy duds our boy Josh brought home from college," suggested his wife.

"I'm only tryin' to scare the crows; not to make 'em laugh themselves to death."

Mother-in-Lawless.

"Miss Gotrox—er—Clara, will you be my wife?" asked the poor but otherwise young dry goods clerk.

"Are you quite sure you love me for myself alone?" queried the fair heiress.

"Of course I do," he replied. "Didn't you tell me you were an orphan?"

Sympathy.

A gentleman traveling on horseback not long ago came upon an Irishman who was fencing in a most barren and desolate piece of land.

"What are you fencing in that lot for, Pat?" said he. "A herd of cows would starve to death on that land."

"And shure, your honor, wasn't I fencing it to keep the poor bastes out of it."—Philadelphia Public Ledger.

Stopping Him.

"I shall never ask you to promise to come home early again," she said sorrowfully when he let himself in at 2 a. m.

"Why not, my dear?" he inquired quietly.

"It's bad enough to be married to a night-hawk and a loafer without making a liar of you, too," she replied, and he had no comeback.—Buffalo Enquirer.

Embarrassing.

A Southern Congressman was in New York on an allowance of twenty dollars a day. A friend found him living in a fine hotel, and said: "Well, John, pretty big snap for you up here, isn't it, with twenty dollars per diem allowance?"

"Forget it," was the answer. "In this town a per diem per day isn't worth a per noctum per night."—Exchange.

His Answer.

A Sunday school teacher had been telling her class of little boys about crowns of glory and heavenly rewards for good people.

"Now, tell me," she said, at the close of the lesson, "who will get the biggest crown?"

There was silence for a minute or two, then a bright little chap piped out:

"Him wot's got th' biggest 'ead."—Exchange.

Getting It Straight.

"Chicago has 6,085 lawyers this year, a gain of 228."

"A gain, did you say?"

Perfectly Natural.

Bimberly—Did your friend Jagolong die a natural death?

Gingerton—That's what. The automobile that struck him was driven by a woman.

Information Wanted.

Waiter (in restaurant)—Pawdon me, sah, but how does yo' all find de oystahs, sah?

Guest—That's just what I was going to ask you. I haven't been able to find any of them yet.

Her Preference.

Hub—I wish, my dear, that you would make a special effort to decrease expenses.

Wife—I'd prefer that you should make a special effort to increase revenue.—Boston Transcript.

Method in His Madness.

Caudle (reading)—This paper gives an account of a married man who sleeps in the stable with his horse every night.

Mrs. Caudle—What's wrong with him? Is he crazy?

Caudle—No, I guess not. A horse can't talk, you know.

Diplomacy.

Little Lemuel—Say, paw, what is diplomacy?

Paw—Diplomacy, my son, is the art of making people believe that you believe they believe what you say, when you know very well they don't.

His First Thought.

Omar—According to statistics, we consume more than 4,000,000 tons of iron annually, or about 100 pounds to each person.

Heinie—Great guns! What a nation of ostriches we must be!

Revised Version.

"Man wants but little here below, nor wants that little long," is what they sang long years ago, but 'tis now a different song. The words we use are different, quite, though fully as sublime: "Man wants everything in sight—and he wants it all the time."

Strenuous Training.

"But are you strong enough to handle heavy trunks?" asked the hotel manager of the lightweight applicant for a job as poster.

"Sure thing," answered the applicant. "My best girl agitates the scales at the 225-pound notch."

They Escape.

"How true it is."

"What?"

"That the rain falls alike on the just and the unjust."

"How about those who work in the subway?" inquired the New Yorker.

SWEEP OUT PADDED CELL NO. 999.

HONEST, IT'S a crime what some of these new impressionistic and futuristic slingers of free verse are doing to the language in which Bill Shakespeare wrote. The latest is what somebody calls "the I school" of blankety-blank versifying. The following half-pint of slush is an excellent (not to say charming) example of the style. Try it on your back porch:

> Considering
> the length of Long Island
> or the circumference of the earth
> or the distance
> between Venus and Mars,
> what's half an inch?
> But applied to your nose,
> my beloved!
> Ah!

The above appears on the front page of "The Book of Smiles" for September-October. It is but one of several humorous paragraphs which tickle the funny bone of the reader of this clever booklet issued by the Standard Dry Kiln Company of Indianapolis, Ind. "The Book of Smiles" is interesting in another way, too. It gives details concerning the high-grade automatic boiler feed pump, the Standard dry kiln and record thermometer sold by this most responsible company.

GASOLINE FROM NATURAL GAS.

One of the bulletins of the U. S. Geological Survey, which carries more than usual interest right now because of the comparatively high price of gasoline, is one dealing with the production of gasoline from natural gas. The report shows that during 1915 this production increased over 50 per cent. Just when the making of gasoline from natural gas was first undertaken on a commercial scale is not stated, but during the year 1915 there were 414 plants extracting gasoline from natural gas, and the total quantity of crude gasoline extracted during the year was 65,346,665 gallons, an increase of 53 per cent. as compared to 1914. The volume of natural gas utilized in this process is given as 24,000,000,000 cubic feet. The average quantity of gasoline recovered per thousand feet was 2.57 gallons. The greatest number of plants making gasoline in this way were in Pennsylvania and West Virginia, but the greatest quantity of production was in Oklahoma and California, the latter two states producing 44,500,000 gallons in this way, or something like two-thirds of the total.

FARM LOANS AND BUILDING.

When the government once gets that new farm loan bank idea to working, the logical and final outcome should be the building of more and better farm buildings. Lack of capital is what restrains many a farmer from building a better home and better and more permanent outbuildings. With the long-time loans at low interest made easy through government co-operation there should naturally follow a much more general disposition to borrow money with which to improve farms. There is hardly a better purpose to which such money and improvement ideas could be turned than in building good, permanent homes and also substantial and permanent outbuildings. It seems to us that this farm loan bank business will materially widen the field of possibilities in the exploitation of brick and other clay products for farm use. With this means through which to obtain the necessary funds to do the right kind of building, it should be comparatively easy to urge successfully brick and burned clay products, which are unquestionably the best building material to buy when building for permanence is the order of the day. So the claywork-ing industry may profit indirectly from this government aid to farm loans, if they but keep up and doing and presenting their products as they should.

DRYING AND BURNING OF CLAY WARES.

The above is the title of the latest catalogue issued by the International Clay Machinery Company, of Dayton, Ohio. As set forth in the preamble facing an interesting view of their factory, this catalogue is devoted to their gas-fired appliances, giving results obtained from the use of the International system of drying and burning, instead of the usual monotonous detailed descriptions and technicalities generally published in catalogues. Most interesting and instructive are the illustrations and descriptive matter relative to gaseous fuel and its manufacture, the producer gas-fired continuous kiln, the International compartment type producer gas-fired continuous kiln, producer gas-fired tunnel kiln, rectangular down-draft kiln, grateless round down-draft kiln, producer gas-fired dryer, metallic rediation dryer, radiated heat dryer, waste heat dryer, dryer and transfer cars. Manufacturers considering the purchase of any produce in this line should write the International Clay Machinery Company, of Dayton, Ohio, for this catalogue and additional information.

THE OLDEST INVESTMENT RECORD KNOWN.

One of the oldest investment records known to history is recorded on bricks preserved in great earthenware jars and dug up during the present generation. It is records of a real estate mortgage loan made 2100 B. C., in the reign of Khammuragas, and later, about 600 B. C., a great Babylonian banking house loaned large sums on mortgages, which were recorded on brick and burned clay tablets.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC.,

required by the act of Congress of August 24, 1912, of THE CLAY-WORKER, published monthly at Indianapolis, Ind., for Oct. 1, 1916.

State of Indiana, County of Marion, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared James E. Randall, who, having been duly sworn according to law, deposes and says that he is the assistant editor of The Clay-Worker, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, T. A. Randall & Co., Inc., Indianapolis, Ind.
Editor, Theodore A. Randall, Indianapolis, Ind.
Assistant Editor, James E. Randall, Indianapolis, Ind.
Business manager, Theodore A. Randall, Indianapolis, Ind.

Owners are T. A. Randall & Co., Inc., Indianapolis, Ind.; Theodore A. Randall, James E. Randall and Denton F. Billingsley, each and all of whom are at 211 Hudson St., Indianapolis, Ind.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

That the two paragraphs next above, giving the names of the owners, stockholders, security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) T. A. Randall & Co.,
Per J. E. Randall.

Sworn to and subscribed before me this 27th day of September, 1916. (Signed) A. E. Buchanan, Notary Public.
[Seal] My commission expires February 27, 1917.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVI. OCTOBER, 1916. No. 4.

CURRENT COMMENT.

These are melancholy days for the pessimist.

* * *

The product that is boosted most is the one that makes the widest circle of acquaintance.

* * *

The largest city in the world ought to attract the largest attendance at the N. B. M. A. Convention March 5 to 10, 1917.

* * *

When the frost is on the pumpkins and the corn is in the shock, we must rustle some dough to get the overcoat out of hock.

* * *

The best building material on earth can always make good, but it can't make the progress it should without more extensive advertising.

* * *

The asphalt shingle is crowding metal off the roof, and meantime burned clay roofing tile is doing too much looking on and not enough getting on.

* * *

We get a share of gasoline from natural gas, and now if we could just convert political gas into gasoline the supply would soon be large enough to ease down the price.

* * *

New York City has many things to attract visitors aside from mere size. For instance, the McAlpin Hotel is itself a stellar attraction. It is in the very heart of the great city, or as has been aptly said, "It is nearer than anything to everything."

* * *

Greater New York is the leading common brick market in the United States about 1,000,000,000 brick being used there annually. The principal source of this supply is, according to the United States Geological Survey, Department of the Interior, the Hudson river region, extending on both sides of the Hudson from New York to Cohoes, including Bergen county, New Jersey, and within the last few years the Raritan river district, Middlesex county, New Jersey, has sent large quantities of common brick to New York.

* * *

With help scarce and high in price there should be more inducement to install labor saving machines and devices.

* * *

The blackmailing game, like the gold brick game, is old and threadbare, but it seems to be still productive of results.

* * *

Keep everlastingly driving home the doctrine of Build with Brick, not only for homes, but also for out buildings—and for good roads.

* * *

Somehow we can't find anywhere in our system of logic any sympathy for the sympathy strike—and not much for any kind of strike.

* * *

The industrial order of the day calls for sickness prevention as well as accident prevention for it is now recognized that poor health is the source of much industrial loss.

* * *

A man should not only make a profit from his business but that profit should be big enough to carry a margin of safety as a protection against unusual and unexpected conditions,

* * *

Cutting the price to move accumulated stock is not boosting the brick game, for its only result is to take some trade away from the other fellow. To really create more trade we must do more constructive exploitation.

* * *

A unique feature of Hotel McAlpin is the swimming pool and baths on the twenty-fourth floor. A swimming and diving contest may be one of the unusual stunts convention week. Spencer Duty and Eben Rodgers and other experts in aquatics please take notice.

* * *

Hollow wall construction is practical with brick as well as with blocks of clay and of cement, and since the hollow wall idea is finding favor with the public there is need for the brick men to give more attention to this subject which has been passed over too lightly heretofore.

VALUABLE CLAY DISCOVERED.

The United States Bureau of Standards is proving an efficient help to business men and manufacturers throughout the country. Examples of this are coming to light every day. Just recently a Florida man conceived the idea that a clay cup for getting turpentine from the trees might prove better than those used at present, especially since the present ones, made from another material, are causing much trouble.

He sent a sample of the clay on his property to the Bureau to see if turpentine cups could be made from it. Not only were some very fine cups made and sent to him, but experts at the Bureau of Standards discovered that the clay was of an excellent quality for the making of vitrified paving brick. As a result of this the Florida man is going to sell his land at a good figure to a brick concern located in his state.

SELLING THE PRODUCT.

The industrial world is beginning to realize the need for more attention to the problem of selling the product. This realization comes from an understanding of the fact that in some respects this problem of selling the product or the output of the plant, which is seemingly simple, is in reality often more difficult than any other problem connected with the industry. There are many intricate and scientific problems connected with industry, but they have certain elements of positiveness about them and certain governing factors that are basic and dependable, so the solution once found is operative right along.

WHY WE TALK SALESMANSHIP.

The proper selling of any product in the clayworking industry, whether it be common brick, face brick, fire brick, hollow ware or terra cotta, consists first in finding out what might be termed the natural demand, and then of estimating the amount of demand or business that can be developed by proper cultivation and exploitation. It is a recognized fact too that the bulk of the best business comes from exploitation, which creates desire and leads to sales. That is why we have been developing in this country the past few years a wonderful interest in the idea of salesmanship. And out of it we have gotten a realization that selling the product is one of the first essentials to success, and often is a bigger problem than any of the problems of manufacture, though at first it would seem to be the simplest proposition going.

GETTING THE PRICE.

A man may go out to sell the product of a plant which is but one plant of a number making the same kind of product and supplying the needs of substantially the same field. Too often a man who goes out under conditions of this kind finally yields to the temptation which presents itself all the time of cutting under the other fellow's price, to the end that he may sell his product to a larger extent and at the same time lessen the volume of sales with some of his competitors. This is quite commonly considered the poorest form of salesmanship, and it does not by any means solve the problem of selling. Indeed it is really one of the things that puts the problem into the selling proposition. The problem is to sell the product at the price that will yield a fair profit in its manufacture, and to sell it in such volume that it will keep the manufacturing plant reasonably busy.

The best evidence one need require of the fact that there has been too much of this kind of selling in the brick business is furnished by the fact that brick have not depreciated much in value through a period of twenty years—a period in which lumber, steel and other products have fluctuated up and down, and in the main have gained considerable in price, much more than has been gained in the average price of brick, though the quality of brick has been improved steadily all through this twenty-year period.

LOCAL CO-OPERATION LACKING.

One great trouble with the brick industry seems to be a lack of local co-operation. This was very strongly impressed upon the writer recently in an interview with a brick man, who was lamenting the fact that it seemed impossible for brick men to get together and get a fair price for their product when in competition with each other. This man had been through some cut-throat competition and incidently had bought in the property of a rival plant after his competitors had failed. Plainly the failure of the rival plant and the loss of profits to this man during the time of its operation were due directly to the fact that they fought each other strenuously with the price cutter.

The brick man said that he could look around him and see a number of laundry men in town who managed to get together some way and all get the same prices for their product. He saw lumber dealers who met in groups and co-operated to get a fair price, instead of cutting each other's throats and giving the consumer all the profits of the business until some one of them went broke. Ice men, merchants and seemingly everybody else but the brick men could get together and work out the selling problem in such a manner as to leave a fair profit for the business. On the other hand, he said it seemed that when there were two or more brick men in the community it was next to impossible to get them together and eliminate price cutting, because they all seemed to operate on the proposition that you must eliminate your competitor before you can hope to get a profit out of business.

Perhaps one explanation of this is in the fact that the brick trade, especially in its organization work, has considered the matter of price talking as a forbidden subject, as one which would lead to trust talk and "trust busting." There was some excuse for this feeling at one time, too, but conditions have changed wonderfully the past few years, especially in the matter of the federal government's relation to organizations and the getting of fair prices out of business.

This change has come about through that new government department known as the Federal Trade Commission, which started in to work some time ago with a view to becoming to the business and industrial world substantially what the department of agriculture is to the farmer; that is, of being helpful in a legitimate, practical way.

THE MISSION OF THE FEDERAL TRADE COMMISSION.

As a preparatory step to help the business, the Federal Trade Commission has been in correspondence with the associations and has been investigating various branches of industry to find out just how things stand with them and how the commission may help improve and build up business. One of the things they found that has made a deep impression is that business everywhere is suffering from what is termed unfair competition, which in turn is derived largely from guesswork as to cost and underbidding the other fellow to get business, regardless of whether it means profits or not.

Having found troubles of this kind in plenty, the Federal Trade Commission is setting about co-operating with business men through their various organizations, to help reduce this ruinous competition through a process of education on costs by a means of uniform accounting, and through developing an understanding of what constitutes a fair price below which there is not room for safe profits.

To put it another way, the Federal Trade Commission, which is a part of our government at Washington, is talking prices itself and is actively encouraging business men everywhere to get fair prices for their product—prices that will insure a margin of actual profits. They realize that for the country as a whole to be strong and stable and prepared to meet every emergency, the business of the country must be strong and on a good foundation and derive sufficient profits to insure its safety and continuation, and, realizing this, they are offering their co-operation to help bring it about. In this co-operation they are not only giving moral support to organizations, but they are actively encouraging their development, and in so doing speak frankly of prices. There is no more need for whispering when the subject of prices comes up, but it is a time for frank talking.

LOCAL ORGANIZATION NEEDED.

The Federal Trade Commission not only wants the bigger organizations, through which it can work with and co-operate with the industry on the larger general problems, but the representatives of this commission advise that when there are two or more people in a given community they get together and exchange information, for this is one of the things that is a great aid to industry.

Under these conditions it seems to be time for every branch of the clayworking industry to get together on the proposition of selling its product and getting the price. There has never been a period in the history of this country when conditions were more favorable, and in practically all other lines of business manufacturers and merchants, through the encouragement and moral support of the Federal Trade Commission, are taking steps to eliminate ruinous competition and to get better prices for their product—prices that will insure a respectable margin of profit. The people in the brick industry are just as human as other people, but in the past they seem to have been a little harder headed about this matter of getting together and solving the problem of selling the product for a price. The trade has gotten together and talked manufacturing methods and accomplished wonderful results in this respect. Now, however, we have before us another problem, one that is easily more difficult in some respects than that of solving some of the technical problems that have been unraveled. Also, we have before us the means by which this problem may be solved. It is simply a question of getting together and doing it. Shall we do so?

OHIO PLANT JOINS DUNN FAMILY OF LICENSEES.

The John Kline Brick Company, Wickliffe, O., is the newest and the thirty-fourth member of the Dunn Wire-cut Lug Brick Company's family of licensees. This is a well-constructed and well-managed plant, with a daily capacity of 40,000. It is a progressive company that makes a high quality of brick which has stood the test of service. Mr. J. C. Kline is president of the company, and he has high repute in the business world.

A NEW DRYER FOR BRICK MANUFACTURERS.

A very practical dryer is in operation at the Duluth Clay Products Company, at Tower, Minn., installed by the Crosby Dryer Company, of Chicago, Ill. The ware is placed on large racks and carried through the tunnels by a new conveying system, passing through a uniform increase of temperature and decrease of humidity from receiving to discharge end of dryer. The dryer is heated by radiation, with ventilation, temperature and humidity under control at all times.

perature and humidity under control at all times.

NEW EDITION OF HENDRICKS' COMMERCIAL REGISTER

The twenty-fifth annual edition of Hendricks' Commercial Register of the United States for Buyers and Sellers, which has just been issued, rounds out a quarter of a century of usefulness by this standard publication. The work is especially devoted to the interests of the Architectural, Contracting, Electrical, Engineering, Hardware, Iron, Mechanical, Mill, Mining, Quarrying, Railroad, Steel and kindred industries, containing about 350,000 names and addresses, with upward of 45,000 business classifications. Full lists are included of Producers, Manufacturers, Dealers and Consumers, listing all products, from the new material to the finished article, together with the concern handling these products, from the producer to the consumer.

There are 1,512 pages of text matter and the index of contents numbers 149 pages covering over 50,000 trade references. The list of trade names, brands, titles of identification, etc., is published for the first time and numbers 202 pages. This list furnishes ready reference for purchasing agents and prospective buyers to distinctive products manufactured by firms listed in the work.

PAVING SPECIFICATIONS.

The latest booklet publication on the part of the National Brick Manufacturers' Association is one on specifications for the construction of vitrified brick street pavements and country road pavements of the green concrete foundation type, cement grout filler. Quite a lot of the splendid, enduring work done by this association has been the conducting of experiments to determine the facts and embody them in concrete form as specifications for constructing the foundation and later the surface of vitrified paving brick. It has been recognized that different types have their peculiar claims under certain local conditions, consequently it is impossible to cover the needs of all kinds of paving in all localities with one set of specifications or one form of construction, no matter how ideal it may be under certain specific conditions. For that reason it has been found advisable to determine the best methods of several different forms of street construction and paving, and the latest offerings in which specifications are carefully and thoroughly compiled has to do with paving in which the brick are laid direct upon a green concrete foundation. Other specification publications preceding it cover the use of paving brick with a sand-cement super foundation, and also with what is known as the sand-cushion type of work, and with this latest publication on specifications added, the National Paving Brick Manufacturers' Association is prepared to supply the right kind of information for the right kind of street or road construction, no matter just what type is favored or desirable for the community doing the work.

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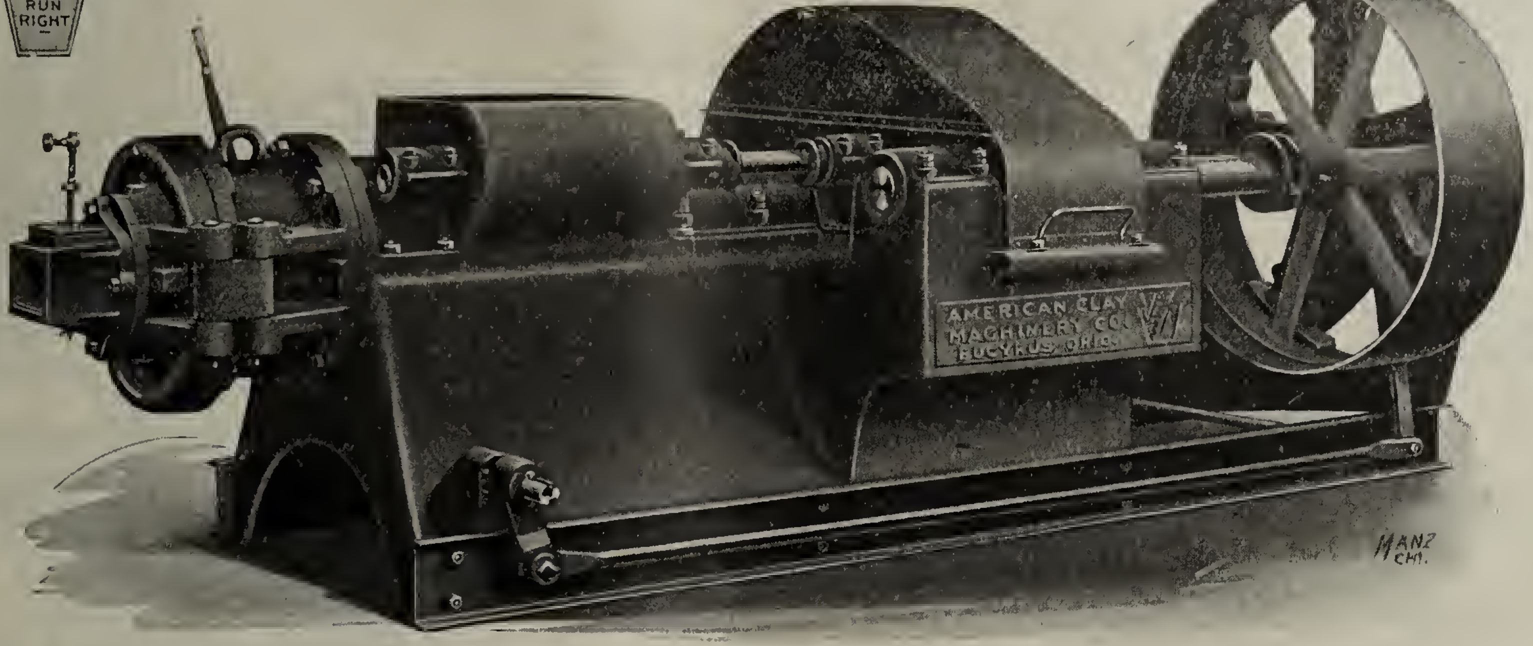
DEVELOPING OUR OWN WHITING.

One of the latest announcements in connection with the development of our native resources in the clay products line is that of a native whiting to take the place of that heretofore imported from England for ceramic glazes and bodies. It is said that a sample of calcium carbonate recently submitted to the Bureau of Standards by a firm in Baltimore was found to be an excellent substitute for the English whiting and gave very satisfactory results in trials that were made with it. Also two refractory plastic clays have been encountered among various samples submitted, both of which are promising for the manufacture of glass pots and crucibles. One is from Cecil county, Maryland, and the other is from near Nashville, Tenn.

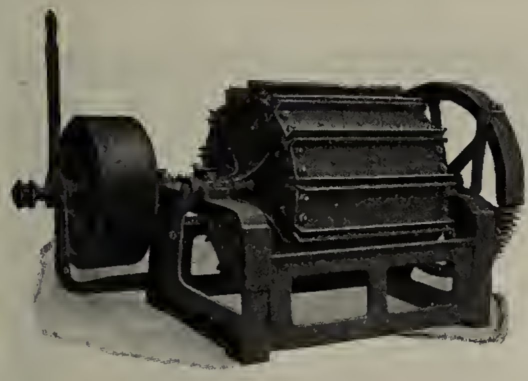
We Build Every Appliance and Machine Needed by Clayworkers.

The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS, OHIO
BUILT RIGHT RUN RIGHT



American No. 290 Auger Machine for Brick and Tile.

The American No. 290 Machine has all the elements for heavy duty and capacity. It makes good both as to ware and wear. Get circular on this machine. It's good for a lifetime of hard service.



American Rattler.

The American Rattler

This rattler is built on specifications of the Bureau of Standards and the N. P. B. M. A. To keep track of your brick quality on your own plant is cheaper than to stand rejections. Description of the American Rattler on request.

American Steam Shovel.

The Haigh Kiln

The Haigh Continous Kiln makes big savings for others—why not for you? It costs you nothing to have us show you what your saving will be. Ask for circular and large picture of the Haigh Kiln.

Haigh Kiln.

American Steam Shovel

The American Steam Shovel is designed for a full yard dipper and carries a yard. Get catalog.

The American Clay Machinery Co., Bucyrus, Ohio, U.S.A.

A Quality in Clayworking Machinery Above All Others.

Ask for One of Our American Flag Bows Free. A New Novelty.

The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS OHIO

BUILT RIGHT RUN RIGHT

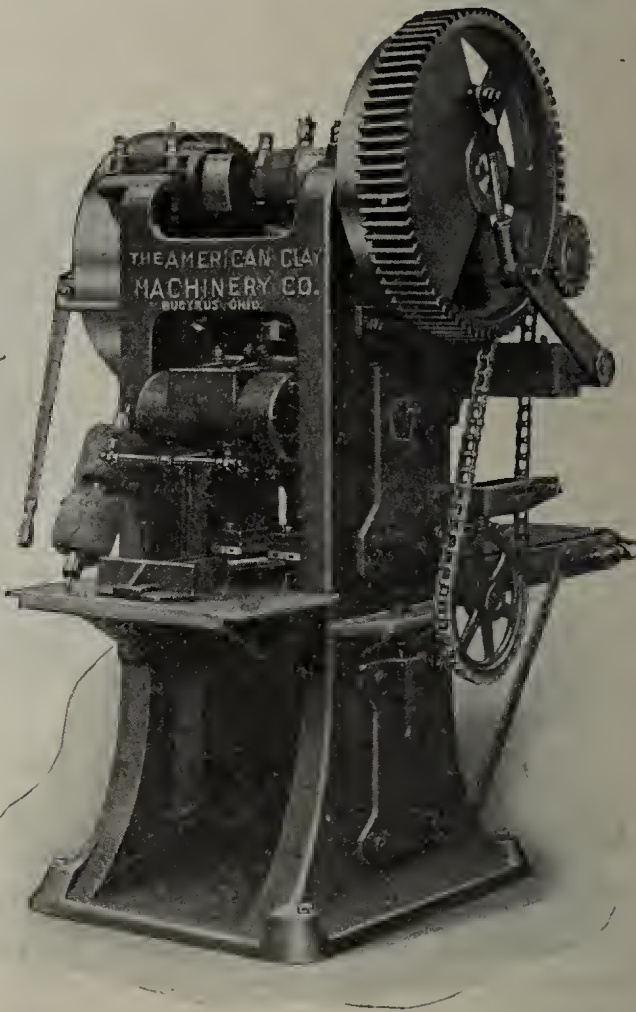
AMERICAN

No. 291 and No. 302 Pug Mills

are identical in construction with the exception that the No. 302 Pug Mill is the pushing type arranged to push the material forward away from the driving end and discharge at the forward end of the shell, while the No. 291 Pug Mill is arranged to pull the material and discharge between the gear frame and the shell.

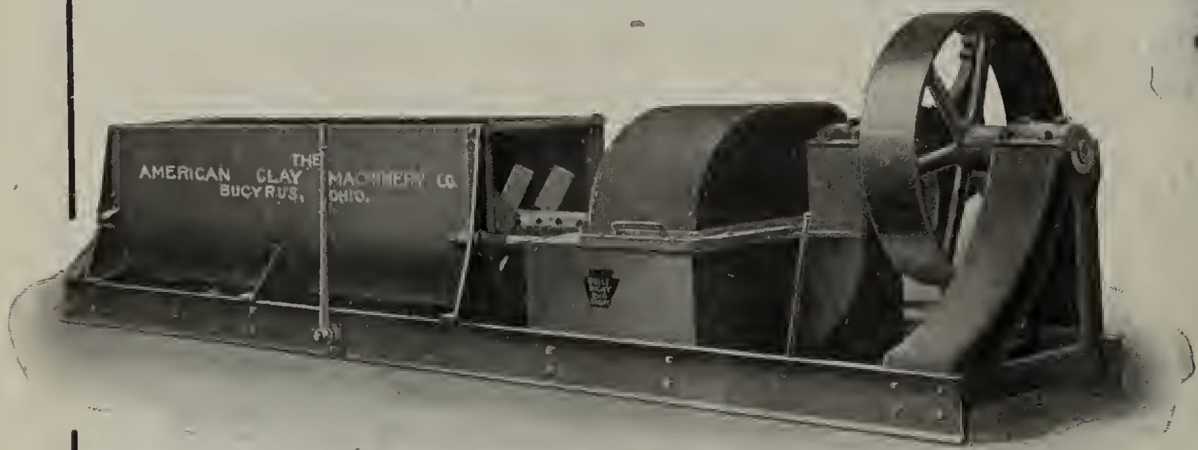
These Pug Mills are built along the lines of all "Built Right Run Right" machinery.

Ask for Pug Mill Bulletin.

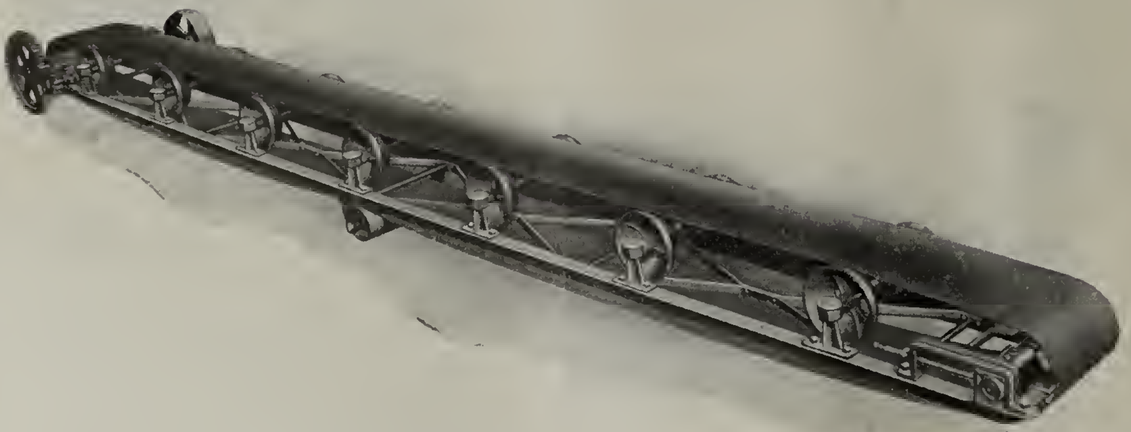


American No. 292 Repress.

The No. 292 Repress is built for durability and strength. The most simple mechanical movements are used for the repressing of paving brick, fire brick and building brick.



American No. 291 Pug Mill.



American Style "B" Conveyor.

American Style "B" Conveyor

For handling clay this American Style "B" Conveyor will be found to give excellent service.

Built strong. Easy to install. Any length required. Ask for Conveyor Bulletin.

The American Clay Machinery Co., Bucyrus, Ohio, U. S. A.

Largest Manufacturers of Clayworking Machinery in the World.

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

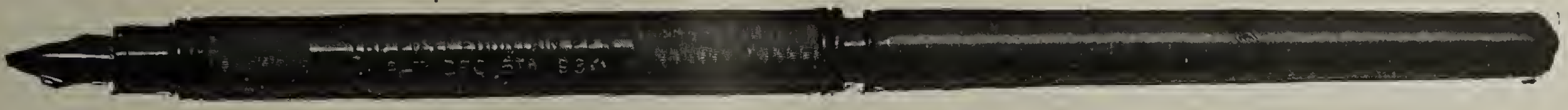
They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

NO. 1
KNOWN
THE WORLD OVER
**SCHURS
OIL BURNER CO.**
Los Angeles, Cal.

NOTICE!
TO
BRICK MFRS.
FOR
QUICK BURNS
AND
BETTER COLOR
BURN OIL
AND USE
**SCHURS
BURNERS**



The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Soiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

The Old Way

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen, Lew Wallace, the author of "Ben Hur," wrote: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

ADDRESS THE CLAY-WORKER, INDIANAPOLIS, IND.

The New Way

**SMOKE ABATE—
SAVING GREAT!**

We design, construct and OPERATE

Continuous and Periodic Kilns

for all purposes.

Our claims of superiority:

1. We handle different types of kilns for coal, gas, oil and producer gas firing, and design each kiln to meet the exact requirements.
2. We do the work at a fraction of the price others ask; no royalty, no patent fee.
3. We recommend only such kilns that have proven successful through many years of operation.
4. We can show you how to operate the kiln after it's built, most of our competitors cannot.
5. We have had more experience in continuous kilns, than all our competitors in this country combined—proof upon demand.

Expert Service

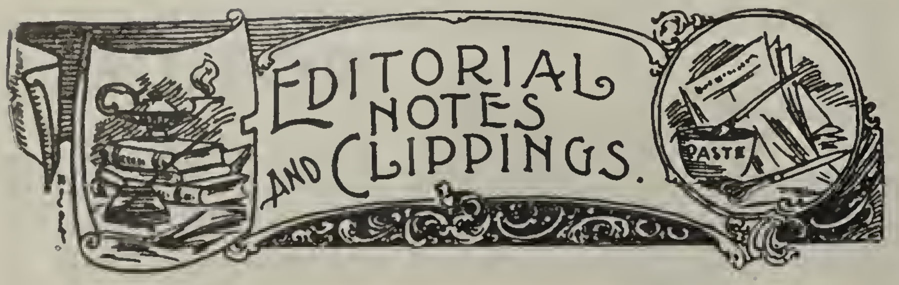
Drawings

Clay Testing

Glazes

Glaze Mills

Richard B. Hoehne & Associates
Ceramic Laboratory and Bureau of Engineering
1218 N. Vandeventer Saint Louis, Mo.



EDITORIAL NOTES AND CLIPPINGS.

The Postville (Iowa) Brick Company's plant, which has been idle for a year or two, has begun operations again.

The American Hollow Tile Co., of New Brunswick, N. J., has been incorporated with $25,000 by William J. Lyle, Robert W. Lyle and Charles Kimball, all of New Brunswick.

The new brick plant of Colburn-Murray Company, of Minneapolis, Minn., will soon be ready for operation turning out a high grade of face brick. The plant is located at Barr Station and will have a capacity of 80,000 brick per day.

The Builders Co-operative Brick & Tile Company, of Nazareth, Pa., has been incorporated by Harry J. Osterstock, of Easton, Pa., who gives the capital stock of the company as $15,000. Mr. Osterstock is treasurer of the new concern.

E. G. Chisholm, with office at 153 Milk street, Boston, Mass., writes that he would like to arrange with one or two more face brick and building manufacturers to handle their product, and he prefers to work on the commission basis.

The Nashville Pottery Company, Nashville, Tenn., has made application for a charter of incorporation, with capital stock placed at $35,000. The incorporators are: D. W. Burns, A. C. Smith, W. H. Harley, W. H. Quarles and I. L. Pendleton.

An effort is being made to put the large brick works at Cameron, near Emporium, Pa., in operation again. L. R. Wilson, of the Lakewood Engineering Co., Cleveland, is helping the citizens of the town in this connection, and can give particulars in regard to same.

Cartwright Brothers, prominent pottery manufacturers of East Liverpool, have purchased the old Chelsea Pottery property at New Cumberland, W. Va., and will begin at once to make necessary repairs and install new machinery preparatory to placing it in operation.

The Phillipsburg Clay Products Company, Phillipsburg, Pa., has purchased 160 acres of land, on which they will erect a brickmaking plant with a capacity of 80,000 brick per day. I. L. Harvey, for many years connected with the Centre Clay & Brick Company, at Orriston, Pa., is to be general manager.

G. L. Simonds & Co., of Chicago, Ill., manufacturers of the Vulcan soot cleaner, has issued an announcement of a change of name. In the future the company will be known as the Vulcan Fuel Economy Co. The change, so the announcement states, is in name only, as the personnel and policies of the company will remain the same.

The wheels of the immense new paving brick plant of the Streator Clay Company, at Streator, Ill., were started running October first, but it will be a month or so before the factory is in full operation. The plant is equipped throughout with the most modern machinery and appliances and when running full handed will have a daily capacity of 100,000 brick.

At the annual director's meeting of the Purington Paving Brick Co., Galesburg, Ill., W. G. D. Orr, of Galesburg, and G. P. Hoover, of Chicago, Ill., were elected directors to succeed the late C. D. B. Howell and P. T. Walsh. According to the reports made to the directors, business has been very good with the company, and seventy-five carloads of paving brick are being shipped daily.

At a recent election of directors of the Baker Clay Company, of Grand Ledge, Mich., E. M. Briggs, of Grand Ledge, was elected to succeed E. H. Baker, of Huntington, Ind. The other directors were elected as follows: Clarkson Beck, John W. Ewing, J. D. Summers and D. D. Shane, of Grand Ledge, and Messrs. Stultz and Bibbus, of Huntington. Mr. Youngs is superintendent of the plant.

After spending a year in experimental work and developing the only high-grade fire clay mine now existing in Western Washington, the Far West Clay Company, of Tacoma, Wash., has begun the manufacture of fire brick at its plant near the city and expects to build up a large trade in Tacoma and other Pacific coast cities. The new brick is the result of a long series of experiments by which it was proved that the deposits of fire clay under the company's control are equal to any similar substances for the manufacture of fireproof building material.

Joseph Posey, an employe of the Saco Brick Company, at Saco, Maine, was instantly killed when he was caught under a kiln wall which collapsed.

Two workmen were quite seriously injured when a kiln collapsed at the Hay plant of the Harbison-Walker Refractories Co., of Pittsburgh, Pa.

Raleigh E. French, is at the head of a new firm organized at Zanesville, Ohio, under the name of the Zanesville Clay Novelty Co., which is capitalized at $10,000.

The Pomona Terra Cotta Co., of Pomona, N. C., will erect a $30,000 addition to its plant, and will also erect four more kilns, thus increasing the capacity of the plant to ten or twelve carloads of terra cotta pipe.

After a month's shut down, due to labor troubles, the plant of the Lehigh Clay Products Company, at Lehigh, Iowa, is again running. The trouble was not on account of wages, but because the company would not recognize the union.

The Consolidated Builders Supply Co., Inc., of Albany, N. Y., has been incorporated with $210,000, they will manufacture and deal in brick and other clay products. Those interested are W. H. Webster, New York, and E. J. Briel, and L. R. Parker, Albany, N. Y.

The Kane Bros. tile yards, at Mt. Pleasant, Mich., which has been owned and operated by them for 35 years, has been sold to S. E. Francis, C. D. Pullen, B. M. Gould, and F. L. Klunzinger. These gentlemen intend to form a corporation for the conduct of the business.

The Shawmut Paving Brick Company, of Shawmut, Pa., of which Alfred Yates is general manager, reports that while business has not been what would be considered booming, still they are shipping paving brick daily to various parts of the country, including points in New England and Canada.

The terra cotta plant of Jacob C. Castle, of Kennett Square, Pa., was almost completely destroyed by fire recently. Mr. Castle estimates his loss at $50,000, and announces that he will rebuild at once. Instead of a four-story building, as before, the new plant will be two stories and be fireproof throughout.

The directors of the Grinnell Brick Co., Grinnell, Iowa, bought up the property of the company when it was put up at public sale recently, and will continue the business for some time under the old firm name. The following men are interested: Grant Ramsey, W. F. Vogt, Senator H. W. Spaulding, J. P. Lyman, Paul Esler, T. J. Bray, C. A. Smith, and R. G. Coutts.

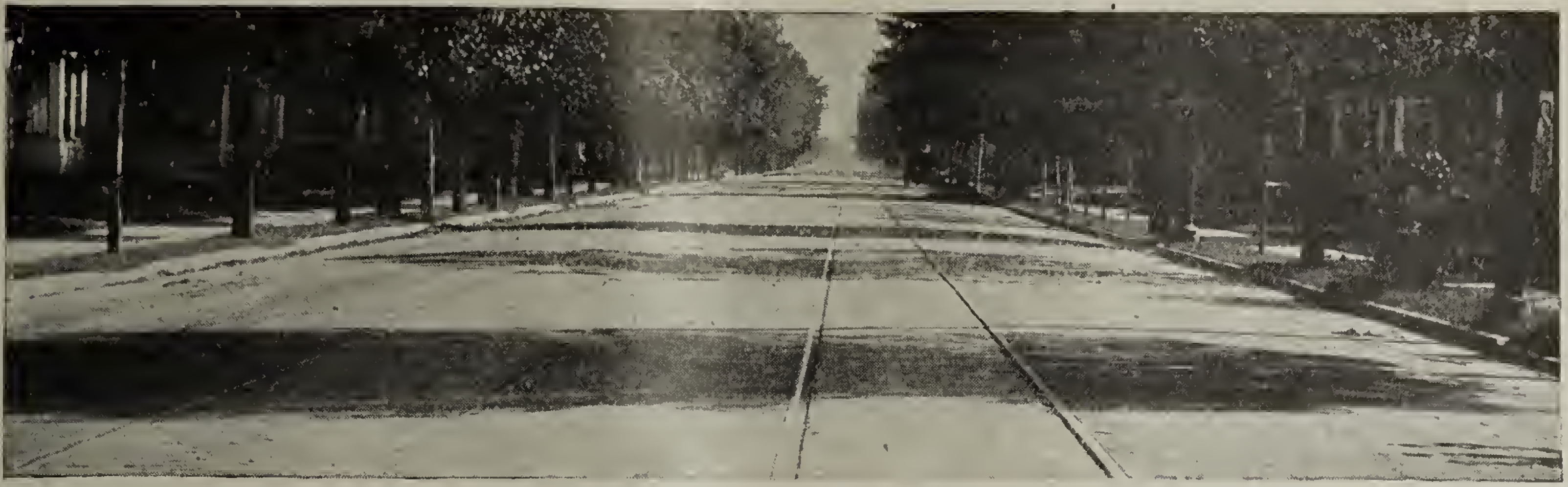
The Shawmut Clay Manufacturing Co., Shawmut, Pa., recently booked a large government contract for conduits for Panama. This is the fifth large order the Shawmut Company has filled for Panama within the past three months, having furnished practically all of the conduits for electric wiring for the government at Panama. The output of the big factory of the company, at Drummond, is sold for months ahead.

James H. Gaimes, who sued the Sioux City Brick & Tile Company, of Sioux City, Iowa, for $25,000 for injuries claimed to have been sustained while in the employ of the company, was awarded a judgment of $825. Grimes alleged that he was permanently disabled on March 1, 1914, while employed by the defendant company. He asserted he was on the platform of a steam shovel connecting the water hose when a defective brace gave away and precipitated him to the ground.

Charles B. Pearson for many years connected with the Virginia Brick Co., Washington, D. C., died at his home in that city October 4. Mr. Pearson was seventy-six years old and had not been active in the business world for some time. He was an ex-president of the National Brick Manufacturers' Association, having been elected president of the association when it met in Washington in 1892. His wife died some years ago, and a brother and sister only survive.

The Denniston Tile Factory, of Fergus Falls, Minn., has just completed an addition to its factory building here and installed a new drain tile making machine that will double its capacity. The new machine is intended for the manufacture of the largest sizes of tile, and will turn out anything up to 52-inch. Up to this time, the factory capacity has been up to about forty tons of tile per day. Hereafter it will be capable of turning out eighty tons per day. The demand for tiling of

(Continued on page 368.)



Colfax Avenue, Benton Harbor, Michigan. Brick (Pitch Filled) on old macadam base.

Barrett's PAVING PITCH

Making Brick Pavements Frost-proof

THESE two pavements in Benton Harbor are laid on an old macadam foundation. The long winter, the deep snows and the many frosts of this region make it imperative that the brick pavement with such a foundation be thoroughly protected against frosts, so the joints are filled with Barrett's Paving Pitch.

Cement filler would have caused trouble by expansion and contraction. Sand filler would have let frost get easy access into the foundation. Asphalt filler lacks adhesion in cold weather and would part company with the bricks, leaving chinks through which water and frost could get in. But Barrett's Paving Pitch keeps its grip on the bricks in all weathers and maintains eternally a flexible waterproof seal.

The old macadam foundations are kept as dry as a bone. Damage by frost is unknown. These pavements, therefore, retain their original perfect contour. There are no cracks, no expansion blowouts, no thrusting up at the curb or against the street car rails; no damage by frost or water.

And Barrett's Paving Pitch will last as long as the pavements.

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TRADE B MARK

Columbus Avenue, Benton Harbor, Michigan. Brick (Pitch Filled) on old macadam base.

EDITORIAL NOTES AND CLIPPINGS—Continued.

all kinds is growing, and in the course of time the factory will be still further enlarged.

M. Berney, H. Silverton, T. J. Callet and others have made application for a charter for the Meteor Brick Company, of Johnstown, Pa.

Lloyd B. Rainey, formerly of Mansfield, Ohio, has been appointed superintendent of the Fallston Fire Clay Company at Beaver, Pa., with three large plants.

The Buffalo Clay Products Company, Inc., of Buffalo, N. Y., has been incorporated by D. J. O'Neil and K. C. and E. F. Knight, of 581 Prospect street, Buffalo, with $10,000 capital stock.

The Whiteland Tile Company, Whiteland, Ind., has been organized by William J. Wright, R. T. Dinners and J. S. Wright. The company, which is capitalized at $25,000; will manufacture drain tile only.

The National Tile Flooring Company, of Connersville, Ind., has been incorporated, with $50,000 capital stock, to manufacture moorish tile. The directors of the company are Edward P. Hawkins, Charles A. Rieman, Marion K. Jamison, Fred R. Leeds, Ward Halladay.

Thomas B. McAvoy, president of the McAvoy Vitrified Brick Company, Philadelphia, has been suffering from a slight attack of ill health during the past few weeks. The nature of Mr. McAvoy's ailment is not believed serious, however, and it is expected that he will be himself again within a short time.

George Cutter, president and general manager of the Sheridan Press Brick Company, at Sheridan, Wyo., has retired, and Carl F. Kneisel becomes secretary-treasurer and general manager. Mr. Kneisel has been in the brick business all his life and has been connected with the Sheridan Company since the year 1905.

Many improvements are being made at the Ohio Clay Product Company's plant at Salineville, Ohio, since the new superintendent, Clifford Wilson, has taken charge of the plant. Two more new kilns are being erected, and the Manufacture Equipment Company, of Dayton, has been installing the Underwood burning system for the past several months.

Harold Copping, the well-known ceramic engineer, formerly of Kankakee, Ill., has been associated with the Philadelphia Textile Machine Company for the past year and has been doing excellent work for that company investigating clay fields and making clay tests. The company advises us that Mr. Copping's services are at the command of any brick manufacturer desirous of investigating the Proctor clay dryer.

Three employes of the Barr Clay Products Company, Streator, Ill., were badly injured when a charge of powder, which they were preparing for blasting in the shale bank, exploded prematurely. One of the men, John Frame, who had both eyes blown out, died several days after the accident, which so far as could be learned was caused by a spark from the steam shovel which was standing near the spot where the men were working.

The New Lexington Clay Manufacturing Company, at New Lexington, Ohio, has been reorganized and is again in operation. W. H. Geis, the well-known brick manufacturer, of Cincinnati, has taken over the interest of Dan McKeever, and will be general manager. Charles Smith will continue as superintendent. The other officers of the company are A. Garlinger, president; G. Morris, vice-president, and G. O. Cullen, secretary-treasurer.

The Grand Rapids Brick Company, of Grand Rapids, Mich., has been reorganized as the Clay Brick Company, with the capital increased to $100,000 and the control taken over by Chicago interests. John J. Moroney, of Chicago, is president; O. M. Carter, vice-president and manager, and C. L. Ross, secretary-treasurer. William J. Clark, for many years manager of the property, will remain with the company for the present. O. M. Carter will go to Grand Rapids from Chicago to be the active manager. The plant will be brought up to date by the new management and new products may be added.

Owing to the fact that the demand for the Thwing pyrometers has been steadily increasing, the Thwing Instrument Company, Philadelphia, Pa., is moving into larger and more commodious quarters, where they will have better facilities for the manufacture of their multiple record pyrometer and other electrical appliances well suited to the use of brick, tile and pottery manufacturers. On and after November 1, the address of the company will be Lancaster and Cuthbert streets, Philadelphia, Pa.

The Northwestern Clay Manufacturing Company, which operates a large sewer pipe plant at Griffin, Ill., has established an office at Aledo, Ill.

The Cannelton Clay Products Company has been incorporated by M. F. Casper, Henry Keck and T. W. Irwin, of Cannelton, Ind., with $20,000 capital stock.

The Dunbar Land Company will build a plant of 50,000 daily capacity at Dunbar, W. Va. The machinery, which will be furnished by the J. D. Fate Company, will be run by electricity.

The Dominion Building Products Company has recently been incorporated at Galt, Ont., Canada, with $1,000,000 capital stock. W. J. Heron is manager and announces that a plant will be erected at once.

The Municipal Brick and Block Company at Martinsburg, W. Va., has purchased the Thompson-Cisler brick plant at New Martinsville, and is moving it to Martinsburg to be consolidated with a large brick plant to be erected on the Butler tract of land along the Kearneyville road.

Charles F. Gosser, one of the most widely known pottery manufacturers in the United States, died at his home in East Palestine, Ohio, October 4, after an illness of only a few days. Death was due to uraemic poisoning. Mr. Gosser was president of the Pope-Gosser China Works. Two brothers survive.

A new concern recently incorporated to manufacture brick and other clay products at Philadelphia, Pa., is the Clifton-Alden Brick Company. Those interested are F. R. Hansell, Philadelphia, and George H. B. Martin and S. C. Seymour, of Camden, N. J. The capital stock of the new company is given at $100,000.

The W. E. Dowlin Brick Company, Billings, Mont., has recently expended $15,000 remodeling and improving its plant. The company has turned out 1,000,000 brick this year, and there is another half a million in the kiln ready for firing within the next few days. The capacity for molding is 25,000 brick a day, and the plant is working at full capacity.

Business is booming at the plant of the Ashaway Clay Company, Providence, R. I. A shipment of half a million bricks of high-grade face type was made to Fall River, Mass., recently, and several carloads of the bricks have also been shipped to Barrington. A new clay pit has been opened, and the officials of the company say that the clay produced is of very good quality.

The Hocking Valley Brick Company, Logan, Ohio, and the Nelsonville Brick Company, Nelsonville, Ohio, have consolidated their interests. For the present the business will be conducted in the names of the individual companies as formerly. J. L. Murphy is president and will have charge of sales. W. H. Parks is vice-president, in charge of plants. D. A. Evans is secretary of the Nelsonville Brick Company, and F. H. Davis secretary of the Hocking Valley Brick Company. The former salesmen of the two companies, M. M. Morrow, C. H. Frank and William H. Luchtenberg, will be retained in the new organization.

The Fulcher Brick Company, Nashville, Tenn., recently entertained the members of the Nashville-Made Club at a luncheon and barbecue, at which pig and lamb and all the accessories of a real barbecue were served. The three Fulchers—J. P., Robert and Philip Fulcher—were admirable hosts, and after the guests had done ample justice to the luncheon they were shown over the plant, which is one of the up-to-date plants of the South. They have seven kilns, five with a capacity of 250,000 brick each and two with a capacity of 85,000 each. They manufacture both by the dry press and stiff clay process. One of the employes at the Fulcher plant has been burning brick for fifty years.

The Ohio State Board of Administration has re-elected Mason Chilcote to the position of superintendent of the state brick plant at Junction City, Ohio. Mr. Chilcote was selected from the eligible list certified by the State Civil Service Commission, and his re-election was unanimous. The position pays $3,000 a year. Since the state leased the Junction City plant, Mr. Chilcote has been in charge of it. He is one of the most capable men in the employ of the state. Almost one hundred prisoners from the penitentiary are worked at the plant under the honor system, and Mr. Chilcote is a favorite with every one of the men. Only two guards are kept at the plant to watch the men, and these two are busy most of the time performing other labors around the plant. It is very uncommon for a prisoner at the plant to take "French leave."

THINK!!!

of

THE UNDERWOOD PRODUCER GAS BURNING SYSTEM
PATENTED

THE JUSTICE CLAY PRODUCTS DRYERS
PATENTED

THE MECO SINGLE ROLL ROCK AND SHALE CRUSHER

Then

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By Investigating.

The Manufacturers Equipment Co.
Dayton, Ohio, U. S. A.
Western Agent: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

Westinghouse Motor Driving Auger Machine.

Why Motor Drive is Best

No. 2.

In brickyards where heavy materials are handled belt slippage results in reduced average speed and increased repair costs.

Westinghouse Individual Motor Drive

has demonstrated to brick manufacturers the value of proper speed for a given machine.

This speed can be maintained continuously, which results in increased production.

A card to our nearest office will bring full information.

Westinghouse Electric & Mfg. Co.

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Sales offices in all large American cities.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THERE IS NOT a great deal of new building work being started at this late date, but still the building trades are very busy with work already under way. In San Francisco there are many important structures going up, and some of them will be inclosed before the regular rainy season sets in, but others will have to take a chance with the weather. In general, the building situation has turned out well for the summer. Aside from the tie-up for a month of the lumber yards here on account of the dockworkers' strike, the building operations have progressed steadily. Delays caused by the strike have in many cases been made up by rush work and extra help. A car shortage on the railroads still hampers deliveries by manufacturers of clay products to a certain extent, but no very serious consequences have been reported recently.

The volume of business on common brick this summer has been exceptionally large, especially in the neighborhood of San Francisco. Several large brickyards in the vicinity have been operating full capacity all season and expect to keep going full blast as long as the weather will permit. Prices on common brick are firm at $8.50 at the yards and $10.00 in San Francisco. There are no reductions from this schedule by the firms in the San Francisco Brick Dealers' Association, and other concerns, for the most part, are glad to maintain this price, which is only fair in view of the cost of manufacture. The face brick market is pretty strong, and certain products in this line are in such constant demand that the manufacturers are behind on orders. Prices on face brick have undergone scarcely any change in the past year, though there is a slightly upward tendency now. Fire brick is in steady demand, at fair prices. The improvement in the fire brick situation has been marked during the year, and there is room for further improvement. The fire brick industry in California has made splendid progress in recent years, and it is generally recognized on the coast that the product is equal to the best made in the country.

The recent improvement in the terra cotta demand has an important bearing on the general building situation, as it goes to prove that higher class buildings are being erected. Practically all the best business blocks in San Francisco are faced with brick, stone or terra cotta, and concrete exteriors are to be seen mostly on warehouses and manufacturing plants. Partition tile and interlocking construction tile have increased greatly in demand this summer for buildings of widely differing character. Roofing tile is making steady headway also, notably for use on small public buildings, schoolhouses, private residences and institution buildings.

At present the market on vitrified sewer pipe is falling off somewhat. It is getting late to start any new public sanitary work on a large scale. The demand, however, during the latter part of the summer was about normal, and it is expected that the sewer pipe demand will receive a decided stimulus next season.

Gladding, McBean & Co. have been awarded the terra cotta contract for the huge Southern Pacific building being erected on lower Market street. The contract calls for terra cotta for the walls and partitions, and also the roofing tile. The same company has the terra cotta contracts for the Santa Fe building at Second and Market streets, the new Yolo county courthouse and other less important jobs. Athol McBean states that the market for high-class face brick has improved considerably during the last few months. The company has had plans prepared for a new barn and tool house to replace the buildings destroyed by fire recently.

C. Berg, president of the Port Costa Brick Works, says the capacity of his plant, fifteen million brick annually, will be taxed to the limit this season. He expects to operate full force for two months longer. The brick of this concern has been supplied this summer for the Porter school of Alameda, the new Redding school and other school buildings, and at present deliveries are being made on the following contracts: The Crocker sugar refinery at Crockett, a job requiring two million brick; the Stauffer Chemical Company of Berkeley, which company is putting up several new buildings for its plant; a business block at Martinez which requires half a million brick; the San Francisco Hospital job, the two new wings of which require 3,500,000 brick, and the new plant of the Columbia Steel Works at Pittsburg, Cal., another very large contract.

Samuel Smith, of the United Materials Company, who is now residing at Elsinore, Cal., on account of poor health, is in San Francisco on a short business and pleasure trip. His health has improved greatly, but he is not taking an active interest in business as yet.

The new unit of the Los Angeles Pressed Brick Company at Elsinore, Cal., has now started operating. The plant is one of the finest of its kind on the coast.

N. Clark & Sons, among other contracts this month, have been awarded the terra cotta contract on the Columbus school, of Salt Lake City. This company is still making heavy deliveries of vitrified sewer pipe to the city of Stockton. Practically all the pipe delivered thus far is 24-inch pipe.

W. W. Dennis, of the McNear Brick Agency, reports a brick contract for 2,500,000 brick for the new Southern Pacific building in San Francisco. This concern has had one of the biggest seasons for a number of years. The plant has a capacity of nearly twenty million brick annually.

The Richmond Pressed Brick Company has been compelled to erect another drying shed, owing to the increased demands for brick. The new building will be about 40 by 125 feet and will have a capacity for 75,000 brick. The company has shipped 114 carloads of brick over the belt railway since it was constructed.

An appeal charging fraud in the award of $17,000 to J. E. Carey for damages to his brickyard at Richmond, which he claimed he sustained during the construction of a tunnel highway, is being prepared by the city attorney of Richmond. Mr. Carey sued for $50,880 recently, and later accepted a compromise of $17,000.

The Anderson Brickyard, at Anderson, Cal., is at present working full time with a crew of forty-six men, in order to supply 1,500,000 brick for the new factory of the Diamond Match Company, at Chico. The order will be completed this month.

The capital stock of the Simons Brick Company, of Los Angeles, has been decreased to $300,000.

The city of Honolulu has arranged for the expenditure of a million dollars for various civic improvements, among which is a sewer system for Waikiki, to cost $150,000.

Joseph Oppenheimer has invested $6,000 in a brick and tile plant at Chewelah, Wash.

The Hamilton Decorative Tile Company, of San Diego, has purchased a site at Culver City, Cal., and will erect a manufacturing plant there, with a 100-foot frontage on Venice Boulevard.

SUNSET.

San Francisco, Cal., Oct. 5.

HORRIBLE FATE.

A western man has had his reason restored by advertising. The inference is plain—those who don't advertise stay crazy. —Cleveland Plain Dealer.

The brick roadway is not only better, but it does not require the expense and annoyance of oiling to keep it in shape for smooth travel.

A SATISFIED CUSTOMER

Is Far More Important to Us Than a Kiln Sale.

We are building a Good Will Business. HOOK DOWN DRAFT KILN USERS are our best salesmen. Their Good Will goes farther than printers' ink. That is the reason for our unusual selling plan.

An order is simply an opportunity for the HOOK SYSTEM to sell itself to you. There is no sale—no obligation to keep it—until you have tested it in your own plant, with your own clay, and are satisfied. This method of finding out, by personal use, the advantages of the HOOK DOWN DRAFT KILN —its exclusive Heat Distributing features, its uniform burning qualities, its time and fuel economy, its perfect simplicity, is open to all clayworkers. YOU can avail yourself of this offer without risk or obligation. We are selling Burning Satisfaction.

Give us the number and size of your kilns, the kind of ware you make and your present burning time and fuel consumption. We will give you an estimate of the saving which the Hook System can make for you and the cost of installing it in your kilns.

HOOK PATENT KILN CO.
614=15 Commerce Bldg.
Columbus, Ohio
Builders of "Ready for Ware" KILNS
Grate Bars and All KILN ACCESSORIES

GANDY and Heat

"We have subjected your Gandy Cotton Belting to severe tests on our starching machine, where it is run in intense heat, and find it is far preferable to leather belting, one Gandy Belt giving us the service of two or three leather belts under the same conditions. Would recommend this belting to any one desirous of a belt capable of withstanding intense heat."

THE baking and hardening influences of intense heat are natural enemies of the pliableness so necessary to good belt service.

Ordinary belting, by reason of its very nature, hardens and stiffens when subjected to high temperatures, but Gandy Belting, owing to the materials used and the process of manufacture, resists these influences to a high degree.

While "intense" heat conditions do not prevail in all shops, this and other advantages, such as immunity to the effects of water, gas, oil, dust and steam simply emphasize the certainty that Gandy will more than make good under ordinary conditions.

There may be a place in your plant where the use of Gandy will mean better service and money saved. Write us—our Service Department will tell you frankly if you can use Gandy to advantage.

The Gandy Belting Co.
749 W. Pratt St., Baltimore, Md.
New York Branch,
36 Warren St.

Written for THE CLAY-WORKER.

NEW YORK AND VICINITY.

PRICES of common brick have advanced within a short time, and it is now impossible to buy anything below $7.50, and $8.00 is asked. Holders declare emphatically that the movement upward has only begun and that common brick will go to $10 before the season closes. No. 1 hard are quoted at the same figure, $7.50 to $8.00. Owing to shortage of labor, which has prevented yards from operating at capacity, it has been quite impossible to keep them up to their possible output. Then, too, demand has increased, and the combination is forcing an advance which will ultimately place brick at the highest point known.

The Atlantic Terra Cotta Company has a contract to supply all the architectural terra cotta for a new building now in process of erection at Fourth avenue and Thirtieth street, in the heart of the great silk district of America. The building is of brick, ten or twelve stories high, and will be occupied by silk firms when finished. Some of the tile work is also furnished by this company.

New York is in such a state of transition at present that it is almost impossible to say how brick and burned clay will fare when the great public works under way are completed and builders begin upon the development which will probably follow the completion of the new subways. It is said by those in position to know that capital now idle will be put to use this coming year in buildings. New York is growing so fast that any ordinary degree of building operations are quite inadequate to accommodate the demand for space. An example of this is seen in a number of loft buildings now in process of erection on the cross streets between Fourth and Fifth avenues. In most cases each floor is rented long before the building is done. And in that locality such floors are expensive. A dozen or more are going up in that vicinity now, and almost all of them are largely burned clay. In all, fire-proofing constitutes an important part of the structural work. Terra cotta decorations are commonly used upon all of them, and so excellent is the work that it cannot be distinguished from hand carving.

New York will always be a brick city. It is no use endeavoring to make it otherwise. All efforts to introduce cement have failed thus far, excepting in a relatively small way. One never sees whole blocks constructed of cement. It appears in foundations; garages and stables are built of it, but when one wants a really substantial and artistically satisfactory structure he goes back to brick and terra cotta. The wisdom of the ancients should not be lightly set aside in favor of a questionable material whose failures have been so numerous as to create perpetual doubt in the minds of those inveigled into using it.

The Atlantic Terra Cotta Company is supplying all the terra cotta used in a large loft building now in process of erection at Fourth avenue and East Thirtieth street. The building is now nearly finished and will be ready for occupancy shortly.

Paving in New York is a lost art. Some one ought to arise with sufficient power and influence to enforce something approaching uniformity and permanency. But unfortunately the long-tortured residents of the city get neither. Permanency disappeared so long since that New York has forgotten its meaning. Uniformity it never knew. On Staten Island the authorities have used brick paving to good advantage. The same observation applies to some parts of Brooklyn, but in New York proper paving has always been, and is now, a lost art. Meanwhile traffic increases, and while the authorities refuse to experiment with brick, the only material which ever can meet the requirements, men, horses and vehicles suffer. BURTON.

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DRYING AND BURNING
ORIGINAL BOSS SYSTEM

BOSS TEN-HOUR DRYER
Dries Easily the Most Tender Clays.
No Live Steam—No Drying at Night.

BOSS SYSTEM of BURNING BRICK
Use the Cheapest Slack Coal or Screenings
and Cut Your Fuel Bill in Half.

Write for Catalogs.

ORIGINAL BOSS SYSTEM
JOHN C. BOSS CO.
Monger Bldg., Elkhart, Ind.
ORIGINAL BOSS SYSTEM

1916 ANNOUNCEMENT

We want a SWIFT SLACK COAL BURNING KILN and a SWIFT HOT-FLOOR DRYER in your vicinity. If there are none—to the first one answering this ad we will furnish one or both PLANS at a cost of the plans alone.

Drop a line to

SWIFT
Lock Box 269, OTTAWA, ILL.

WHO PAYS?

for the waste of time and fuel at your kilns ==YOU.

But YOU can stop this waste by installing

HOOK'S LATEST IMPROVED PATENTED UP and DOWN DRAFT uniform clay burning SYSTEM.

GUARANTEED

Can be built into old or new kilns at a moderate cost.

MR. C. HOOK is associated with this company and WE own and control all of his latest improvements in kilns, including his

GRATELESS FURNACE DRY KILN.

It's worth investigating. Let us "Tell You" more about it.

OHIO KILN COMPANY
Main Office VIGO, OHIO

Classified Advertisements

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

BRICK PLANT FOR SALE.

Part or all. For information write BARDIN ELECTRIC & POWER EXCHANGE, 3043 2nd Ave., So.,

7 tf dm Minneapolis, Minn.

FOR SALE.

Two No. 36 American Ring Hammer pulverizers; run only a short time. Address, L. L. STEPHENSON,

8 tf d Lovick, Ala.

FOR SALE.

Lyon 4-mold dry press.

1—American 14-ft., open-top pug mill.

1—Raymond No. 777 auger mill.

All in good condition.

WALSH FIRE CLAY PRODUCTS CO.,

9 3 d St. Louis, Mo.

FOR SALE.

Cheap, a practically new model "JA" Freese brick machine, and "C-40" cutter. Run less than 3 months. One American Clay Machinery Co.'s repress No. 292, used less than 30 days.

Address BOX 10—N. Y.,

10 2 d Care Clay-Worker.

FOR SALE CHEAP.

Powell shale and clay planer, nearly new.

Steel frame for 50-ft. bank, can be readily reduced to any height. Write for particulars.

STANDARD BRICK MFG. CO.,

Room 8 Furniture Bldg.,

10 2 d Evansville, Ind.

FOR SALE CHEAP.

One New Haven vertical brick machine and pug mill.

One Potts disintegrator.

One Horton sander.

One 12x14-in. Automatic engine, made by the Valley Iron Works, Williamsport, Penna.

One Atlas engine, 12x20-in.

One Atlas tubular boiler, 54-in.x14-ft-0-in.

One 70-h.p. Economic boiler.

One tubular boiler, 3-ft.-6-in.x12-ft.-0-in.

Address GEO T. DICKOVER & SON,

10 3 c Wilkes Barre, Penna.

FOR SALE.

One 9B Brewer tile machine with dies from 3½ to 18 inches, inclusive. In good condition, practically as good as new. MARTIN BROS.,

10 1 d Dunkirk, Ind.

FOR SALE.

Eighty acres of tested clay lands, suitable for floor tile, etc., in Greene county, Indiana. No. 4 coal at depth of 10 to 30 feet. J. A. WARNER,

8 3 cm R. R. No. 2, Lyons, Ind.

FOR SALE.

1—Freese Union brick machine.

1—Freese automatic rotating cutter.

1—Hetherington rattler, almost new.

Irons for hot air dryer.

1—Small concrete mixer.

1—Atlas engine, 14x26.

2—Piano wire screens.

1—No. 5 Champion crusher.

Wanted: 1 9-in. iron frame dry pan.

Address,

FRANK H. ROBINSON,

1230 Fulton Building,

10 1 d Pittsburgh, Pa.

FOR SALE.

BRICKYARD EQUIPMENT.

An excellent opportunity to secure an entire brickyard outfit cheap. Three-quarter yard shovel; winding drum hoist; double geared pug mill; Potts brick machine; 300-foot cable conveyor, delivering brick to the racks; open air racks and pallets for approximately 400,000 brick. Equipment complete for an entire open air yard, all in excellent condition. Inspection invited. Ground has to be vacated. Apply

THE COLLINGWOOD BRICK CO.,

10 2 d Toledo, Ohio.

FOR SALE.

This machinery is all in good working condition and is sold only because of installation of electric equipment. At the time of writing this advertisement it is all operating, but will be available for delivery soon.

One Corliss engine, 18-in.x42-in. Recently rebored and overhauled. Shows a good indicator card.

Two No. 2 Thew shovels ¾-yard bucket. Both in good working condition. A new boiler has been installed in each shovel recently. These shovels are stripping and digging shale for 65,000 brick per day. Just the machine for a moderate size plant.

Prices and further particulars can be obtained from the

STREATOR BRICK CO.,

10 1 d Streator, Ill.

FOR SALE.

Common brick plant, 30,000 capacity per day, 15 miles from Cincinnati, product always oversold. Cost over $40,000, can be bought for about half. Address COMMON BRICK, care Clay-Worker.

8 tf d

FOR SALE.

At a sacrifice price, one horse-power brick machine, Dirt Carts and Molds, One Martin Hand Repress, good as new. One Side Cut Automatic Brick Cutter. One C. W. Raymond Brick & Tile Machine, Pug Mills, Dry Sheds, Down Draft Kilns. All the above in first-class running order, offered for less than half actual cost. The owner is no brick man and has no use for it. If interested, write for full particulars. Address

BOX 10—CASTLE,

10 1 d Care The Clay-Worker.

WANTED, ETC.

WANTED.

Second-hand Eagle horsepower brick machine. E. A. STECKEL,

9 2x cm Richland, Mo.

WANTED.

Position as superintendent or burner on any kind of brick or clay plant. Best reference. BOX 10, J. A.,

10 1 c Care The Clay-Worker.

WANTED.

Small second-hand upright pug mill in good condition. Give full particulars.

ATLANTIC TERRA COTTA CO.,

9 2 d Perth Amboy, N. J.

WANTED.

Position by a man thirty years old, as foreman or head burner on stiff mud or dry press plant with down draft kilns. Have had ten years experience with one of the best plants in the Middle West. Have had a great deal of experience in handling paving brick. Can furnish A No. 1 references. Address

BOX 10—L. J. C.,

10 3 mx Care The Clay-Worker.

WANTED.

Position as superintendent of face brick plant. Have had many years experience in the handling of men and machinery. Now located with large successful plant, but for personal reasons desire to make change. Can give best of references. Competent to take entire charge of plant.

Address BOX 10—E. T.,

10 3 d Care The Clay-Worker.

Classified Advertisements.

WANTED.

Superintendent for paving brick plant. Must be thorough and capable of handling labor. References required.

BOX 9—BRICK PLANT,
9 tf dm Care Clay-Worker.

WANTED.

A man thoroughly competent to take management of brick and tile plant, $50 per week salary; must make small investment in company.

W. G. LOWREY,
717 Plymouth Bldg.,
10 3 c Minneapolis, Minn.

WANTED.

Position as superintendent in brick or sewer pipe plant. Twenty-five years' practical experience in America, England and Canada. Excellent testimonials.

J. BOND,
195 25th and Jackson Ave.,
10 1 c Elmhurst, N. Y.

WANTED.

An assistant superintendent for a roofing tile plant. Must have practical experience in burning, glazing and be able to handle men. Give reference. Unless you have all of these qualifications do not answer. Address

ROOFING—BOX 10,
Care Clay-Worker.

WANTED.

Situation as superintendent of responsible concern. Have had over 20 years of practical experience in manufacturing common, vitrified paving, dry pressed and wire-cut face brick, also partition tile or hollow ware.

Can design and erect various types of up-draft, down-draft and continuous kilns, also direct and waste heat dryers and complete brick and tile plants. No. 1 references. Address,

BOX 6—LAKEWOOD,
6 tf d Care Clay-Worker.

DRAFTSMAN WANTED.

We offer a position as an assistant draftsman that ought to appeal to an ambitious, energetic young man who desires a permanent position with an old, established firm, manufacturing clayworking machinery. A young man who knows something of the manufacture of sewer pipe and other clay productions and has a talent for planning and designing machinery and the installation of equipment, will find the position a desirable one. Must be a man of good habits. In answering give present or previous occupation. Address

BOX 8—MANUFACTURER,
Care Clay-Worker.

MINERS. **MANGANESE** GRINDERS.

BEST QUALITY MANGANESE, CAREFULLY AND UNIFORMLY PREPARED FOR BRICKMAKING. WRITE US FOR SAMPLES AND PRICES.

NATIONAL PAINT AND MANGANESE CO.
LYNCHBURG, VA.

WE ARE PREPARED TO MAKE PROMPT SHIPMENTS.

WANTED POSITION

With live face or paving brick plant. Experienced in every department. Technical education. Expert burner. Experienced kiln builder and designer. Can handle any labor efficiently. Now in charge of large plant. Sales experience. Address

BOX 9—EXPERIENCE,
Care The Clay-Worker.

WANTED.

An inside foreman for large paving brick plant. American machinery and Freese cutter. One first-class man need apply. Address

U. B.—BOX 10,
10 1 d Care Clay-Worker.

WANTED.

A 4 or 5-foot dry pan, in good condition. Advise make, condition and lowest cash price. Address

D. C., BOX 10,
10 1 d Care The Clay-Worker.

WANTED.

A draftsman for mechanical department of a clay machinery establishment. A man capable and of good habits will be given a permanent situation. References required. Address

CONFIDENTIAL, BOX 10,
10 1 l Care The Clay-Worker.

WANTED.

To buy a brick plant within 250 to 400 miles of Chicago or Indianapolis. The plant must be in good condition, and the price right. Capacity from 60,000 to 100,000 per day. Address

BOX 10—RANDOLPH,
10 1 d Care The Clay-Worker.

WANTED.

General manager for a pottery. Must be experienced in vitreous and solid porcelain sanitary ware. Plant located near New York. Address, giving full particulars and salary desired. All communications held in strictest confidence.

BOX 9—WOLFF,
9 2 dm Care Clay-Worker.

HERE IS A MAN

Who is open for engagement as manager or superintendent for a clayworking plant. Brick, hollow tile, fire brick, sewer pipe, terra cotta or pottery. Can produce first class results, increase profits, introduce new methods. Has excellent references and known as one of the most up-to-date clayworkers.

CAN YOU USE HIM, MR. PLANT OWNER?

Address OHIO,
10 tf xm Care Clay-Worker.

THE COAST LINE TO
MACKINAC

DETROIT,
CLEVELAND BUFFALO,
NIAGARA FALLS.

TOLEDO,
PT. HURON, ALPENA.
ST. IGNACE.

A REAL VACATION

The D. & C. Line Steamers embody all the qualities of speed, safety and comfort.

"D. & C. A SERVICE GUARANTEE"

Daily service between Detroit and Buffalo and Detroit and Cleveland. Delightful day trips during July and August, also two boats out of Detroit and Cleveland every Saturday and Sunday nights during these two months. FOUR TRIPS WEEKLY FROM TOLEDO AND DETROIT TO MACKINAC ISLAND AND WAY PORTS—June 25th to Sept. 10th, SPECIAL STEAMER CLEVELAND TO MACKINAC ISLAND. TWO TRIPS WEEKLY. NO STOPS ENROUTE EXCEPT AT DETROIT EVERY TRIP. Daily service between Toledo and Put-in-Bay, June 10th to Sept. 10th.

RAILROAD TICKETS ACCEPTED on D. & C. Line Steamers between Detroit, Cleveland and Buffalo, either direction.

Send two cent stamp for illustrated pamphlet and Great Lakes Map. Address L. G. Lewis, G. P. A., Detroit, Mich.

DETROIT & CLEVELAND NAVIGATION COMPANY

P. H. McMILLAN, Pres.
A. A. SCHANTZ, Vice-Pres. & Genl. Mgr.
Central Standard Time.

From Our Factory to Your Factory

Mr. Clayworker is Your Factory Uptodate:

Is it equipped with sanitary toilet fixtures? The health and comfort of employes is an important matter to every manufacturer. Good workmen appreciate conveniences. In these days, when labor is scarce, it behooves every employer to safeguard and protect his workmen in every reasonable way. Good health is essential to efficient work. Disease and sickness demoralizes the best of workmen, so to insure steady, reliable labor the wise manufacturer protects and safeguards his employes by providing safe, comfortable, healthy surroundings and conveniences. For this reason the demand for sanitary ware for factories and machine shops has increased many fold of recent years. We make a specialty of high grade yet comparatively inexpensive sanitary ware for such purposes, and supply same direct to users for factory purposes.

FORDS SANITARY

- *Drinking Fountains*
- *Porcelain Lavatories*
- *Water Closet Bowls*
- *Urinal Stalls*
- *Laundry Trays*
- *Kitchen Sinks*
- *Bath Tubs*
- *Etc., etc., etc.*

Catalogue and prices on request.

THE FORDS PORCELAIN WORKS, Perth Amboy, N. J.

WIRE-CUT LUG BRICK PLANTS INCREASE RAPIDLY

34 Companies Operating 54 Plants

The largest paving brick companies in the world are included in the following list of independent competing companies licensed to **make Wire-Cut Lug brick:**

Licensed Manufacturers

Corry Brick & Tile Co., Corry, Pa.
United Brick Company, Greensburg, Pa.
Plant at Conneaut, Ohio
Sterling Brick Company, Olean, N. Y.
Reynoldsville Brick & Tile Company, Reynoldsville, Pa.
Danville Brick Company, Danville, Ill.
Clinton Paving Brick Company, Clinton, Ind.
Alton Brick Company, Alton, Ill.
Medal Paving Brick Company, Cleveland, Ohio
Plants at Cleveland, Carrollton, Malvern and Wooster, Ohio
Metropolitan Paving Brick Company, Canton, Ohio
Four Plants at Canton, Ohio, and One at Willow, Ohio
Bessemer Limestone Company, Youngstown, Ohio
Three Plants at Bessemer, Pa.
Peebles Paving Brick Company, Portsmouth, Ohio
Two Plants at Portsmouth, Ohio and One at Firebrick, Ky.
Murphysboro Paving Brick Company, Murphysboro, Ill.
Southern Clay Manufacturing Co., Chattanooga, Tenn.
Plants at Robbins, Tenn.; Coaldale, Ala., and Birmingham, Ala.
McAvoy Vitrified Brick Company, Philadelphia, Pa.
Plant at Perkiomen Junction, Pa.
Windsor Brick Company, Akron, Ohio
Hocking Valley Brick Company, Columbus, Ohio
Plant at Logan, Ohio
Veedersburg Paver Company, Veedersburg, Ind.
Springfield Paving Brick Company, Springfield, Ill.
Terre Haute Vitrified Brick Company, Terre Haute, Ind.
Albion Vitrified Brick Company, Albion, Ill.
Alliance Clay Product Company, Alliance, Ohio
Westport Paving Brick Company, Baltimore, Md.
Mack Manufacturing Co., New Cumberland, W. Va.
Four Plants at New Cumberland, W. Va.
Hydraulic-Press Brick Company, St. Louis, Mo.
Barr Clay Company, Streator, Ill.
Burton-Townsend Company, Zanesville, Ohio
Two Plants at Zanesville, Ohio
Trimble Paving Brick Company, Dayton, Ohio
One Plant at Trimble, Ohio, One Plant at Glouster, Ohio
Thornton Fire Brick Company, Clarksburg, W. Va.
One Plant at Thornton, W. Va.
Indiana Paving Brick & Block Company, Brazil, Indiana
Standard Brick Company, Crawfordsville, Indiana
Shawmut Paving Brick Works, Shawmut, Pa.
Pennsylvania Clay Co., Pittsburgh, Pa.
Plants at Bradys Run, Pa.; Crows Run, Pa., and Conway, Pa.
Clydesdale Brick & Stone Company, Pittsburgh, Pa.
Plant at Ellwood City, Pa.
The John Kline Brick Co., Wickliffe, Ohio

The Dunn Wire-Cut Lug Brick Co.

(Licensors)

Conneaut, Ohio

WIRE=CUT LUG BRICK SALES MAKE NEW RECORD

In **1916 the sales of Wire=Cut Lug Brick were 60 times as much as in 1910**==the figures were 138,276,174 and 2,225,800 in the respective years.

The year 1916 will far outstrip the year 1915.

JULY, 1916, was the **BIGGEST SALES MONTH** in the history of Wire-Cut Lug Brick up to that time.

AUGUST, 1916, the **Sales Were 29% Greater than in July.**

In 1910 only **two companies** with **two plants** were making Wire-Cut Lug Brick. These companies had a combined **capacity of 12,000,000** blocks.

In **1916** there are **34 companies** operating **54 plants,** in 11 states, **making Wire=Cut Lug Brick.**

In 1910 **one state** was using Wire-Cut Lug Brick.

In 1916 **twenty=one** states and the **Dominion of Canada** are using Wire-Cut Lug Brick.

Wire=Cut Lug brick have been laid in 440 places.

30 cities, including Baltimore, St. Louis, Toronto, etc., **specify Wire=Cut Lug brick exclusively** for brick pavements.

Write for data.

The Dunn Wire=Cut Lug Brick Co.

(Licensors)

Conneaut, Ohio

PAVING BRICK MAKERS ARE CONCERNED IN FACTS STATED HEREIN

The Dunn Wire-Cut Lug Brick Company has done more than any other single agency to promote the paving brick industry.

The 400 delegates to the N. P. B. M. A. convention at Terre Haute, Ind., who visited Paris, Ill., on October 6 to inspect the monolithic brick pavements in Edgar county, by their visit paid a tribute to the Dunn Wire-Cut Lug Brick Company, of Conneaut, O., whose engineering department, Mr. W. T. Blackburn, the consulting engineer, especially, developed the true monolithic pavement, in which the brick are laid directly upon a green concrete foundation and then bonded with cement grout filler.

HUNDREDS OF ENGINEERS, county and city officials and state highway authorities have **declared the monolithic pavement** to be THE HIGHEST ACHIEVEMENT IN BRICK PAVEMENT CONSTRUCTION—solid, smooth, durable and practically noiseless.

PROMINENT CONTRACTORS VOICE THE SAME SENTIMENT.

This is only one of many improvements the Dunn engineering department has developed.

The CEMENT-SAND BED CONSTRUCTION FOR WIDE CITY STREETS is being adopted by large cities to the exclusion of all other types of brick pavement, and, as in the case of monolithic pavement, **Wire-Cut Lug Brick are used because of their great bonding strength** and square edges which assure a smooth, even surface and durable pavement.

DUNN ENGINEERS' ADVISORY SERVICES ARE FREE upon request wherever wire-cut lug brick are used. This co-operation with the engineer in charge assures good construction and the use of proper materials; it protects the manufacturer of the brick, the reputation of the brick and the taxpayers who pay for the pavement.

CHIEF ENGINEERS AND BOARDS OF PUBLIC WORKS in the largest cities avail themselves of this service and express high appreciation of its value.

The **most serious obstacle the paving brick industry has to overcome is the misuse of material in construction of pavements.** Ignorance and carelessness are responsible for most poor brick pavements. Poor constructional methods and poor auxiliary materials on paving jobs injure the paving brick industry.

The **Dunn Wire-Cut Lug Brick Company's engineering service aims to eliminate these hazards for the makers of wire-cut lug brick.** The engineers are constantly experimenting with new methods in order to get better results.

Is not this service worth while to the licensee?

Then there is the publicity and promotion service, national in scope, the benefits of which the licensee enjoys.

AN EXPERT CERAMIC ENGINEER with the Dunn company assists licensed manufacturers of wire-cut lug brick to solve their problems and overcome factory and kiln troubles.

The Dunn company SPARES NO EFFORT TO ASSURE A GOOD QUALITY OF BRICK and, so far as the advice of its engineers is followed, to secure GOOD CONSTRUCTION with proper materials.

A COMPANY MUST DEMONSTRATE ITS ABILITY TO MAKE GOOD BRICK and it must be of good repute in the business world OR IT CANNOT GET A LICENSE TO MAKE WIRE-CUT LUG BRICK.

IF A LICENSED COMPANY FAILS TO KEEP ITS PRODUCT UP TO STANDARD, ITS LICENSE IS CANCELLED.

The fact that a company after being licensed continues to make wire-cut lug brick is evidence that it makes a good quality of wire-cut lug brick.

Troubles will arise at times and a kiln may turn out bad, but the DUNN CERAMIC ENGINEER IS READY TO HELP remedy the fault if it be not due to carelessness.

Write for information.

The Dunn Wire-Cut Lug Brick Co.

(Licensors)

Conneaut, Ohio

SOME SUPERIOR FEATURES
of
WIRE=CUT LUG BRICK

Wire=Cut Lug brick are **not repressed.** The **interior structure** is **homogeneous,** of **uniform density** and free from marked lamination.

Wire=Cut Lug brick have uniform lugs which assure **perfect alignment** in courses and **free flow** of **bonding material** to the bottom of the brick and to all parts of the joints.

Wire=Cut Lug brick have **rough contact sides** which make sure **a perfect union** between the brick and the bond.

Wire=Cut=Lug brick have a **double=beveled end** which gives a **strong bond at the end joint.**

Wire=Cut Lug brick have **square edges** which give a **flush grouted joint** at the wearing surface. Such a surface **remains smooth** and **even,** though not slippery, because the **grout cannot jump out** or **chip out of the joints** and allow the brick to cobble and the pavement to become rough and dirty.

Wire=Cut Lug brick pavements remain smooth if properly constructed; they are clean. sanitary and durable.

The street cleaning department of **Cleveland has records** showing that it **costs** only **from one=fourth to one=third as much to keep a smooth brick pavement clean as it costs to keep clean any other type of pavement.**

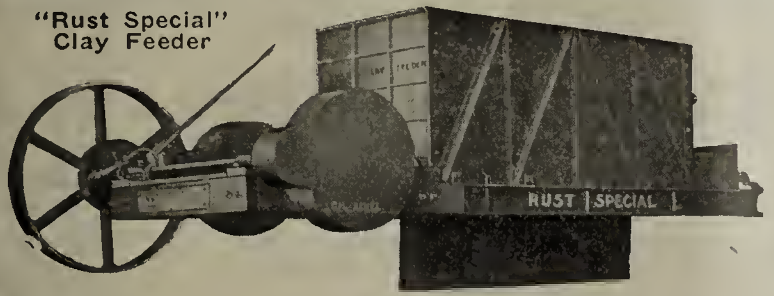
There is **no record known** to us of a properly constructed **wire=cut Lug brick pavement having had to be resurfaced** or reconstructed, or **having cost anything for repairs** or **maintenance** not caused by cutting into the pavement.

Let us tell you more.

The Dunn Wire=Cut Lug Brick Co.
(Licensors)
Conneaut, Ohio

Tempers Clay Perfectly—Improves Product—Speeds up Plant

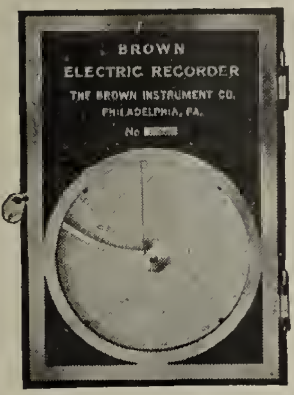
"Rust Special"
Clay Feeder



Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your off-bearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

PYROMETERS



A Brown Pyrometer on your kilns will pay for itself in two months in the saving in fuel alone, not to mention better ware produced.

Send for 56 page Catalog No. 17

BROWN INSTRUMENT CO.
PHILADELPHIA, PA.
New York Pittsburgh Chicago

THE ROESSLER & HASSLACHER
Chemical Company
New York

PREVENT SCUMMING
by treating your
BRICK & TERRA COTTA CLAY PRODUCTS
during process of manufacture with our
PRECIPITATED CARBONATE BARYTES

Make Your Slogan
"SCUMPROOF PRODUCTS."
Write for literature.

BRANCHES

Cleveland,	Ohio
East Liverpool,	Ohio
Chicago,	Ill.
Kansas City,	Mo.
St. Louis,	Mo.
Boston,	Mass.
Philadelphia,	Pa.
New Orleans,	La.

HIGH GRADE CHEMICALS
COLORS and OXIDES
for
Brick, Terra Cotta
Tile, Clay Products
Also
Pottery, Glass
And Enameled Ware

THE OREGON KILN

A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.

EASTON, PA., U. S. A.

Correspondence solicited.

Chattanooga Paint Co.,

Chattanooga, Tenn.

Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.

If...

You Want to Sell or Buy...

Second-hand Clayworking Machinery, Tile Mills, or anything pertaining thereto.

If... You Want a Man

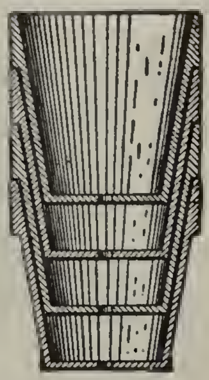
for any position or a position in any connection with the Clayworking Trades use the

For Sale and Want Columns of...

The... Clay-Worker.

RATES

For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of seven words to line. Head line counts as two lines.



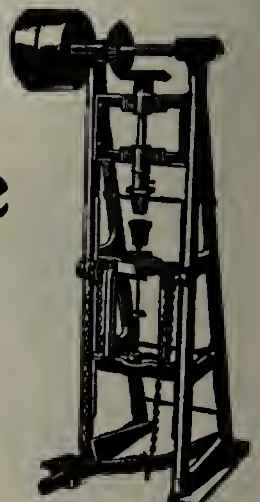
Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.



The Rockwood Mfg. Co.,

1801 English Ave. INDIANAPOLIS, IND.

New Books Which Are Being Offered To the Trade:

HOLLOW TILE HOUSE, by Fred'k Squires, Price, $2.50.

A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

CEMENT, CONCRETE & BRICK, by A. B. Searle, Price, $3.00.

A book dealing with the raw materials, methods of manufacture, testing, chemical and other changes in drying and burning, etc., of the above-mentioned building materials.

SOLD BY

T. A. RANDALL & CO. (Inc.) Indianapolis, Ind.

PHILLIPS & McLAREN CO.

PITTSBURGH, PA.

Builders of
Pittsburgh Standard
Dry and Wet
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office
Stephen Girard Bldg.
Philadelphia, Pa.

PHILLIPS & McLAREN CO.
BUILDERS
PITTSBURGH PA.
No.36

$2.00 *THE CLAY-WORKER* ONE YEAR (IN ADVANCE) **$2.00**

Conveying, Elevating and Power-Transmitting Machinery.

The only perfect spiral conveyor. Continuous flight—no laps or rivets.
A Complete Line of the Best Supplies.

Belt, Chain and Cable Conveyors.

Ask for General Catalogue No. 38.

H. W. CALDWELL & SON CO., Chicago

Fulton Bldg., Hudson Terminal, No. 50 Church St., New York
117 Main St., Dallas, Texas

OAK HILL
GAS RETORT
AND
FIRE BRICK
WORKS

The Parker-Russell
Mining and Manufacturing Co.
ST. LOUIS, U. S. A.

Fire Clay and Silica Products of Quality for Service—Especially for Kiln Construction.

Books of Interest to the Clayworker

REFRACTORIES & FURNACES, by F. T. Harvard, E. M. Price $4.
Gives much valuable information relative to the properties, preparation and application of materials used in the construction and operation of furnaces.

CERAMIC GLAZES, price $10.00.
The book is remarkable for its systematic thoroughness, no more finely arranged charts of glazes in the way of careful gradations, coupled with extensive variations, could well be imagined.

Sold by

T. A. RANDALL & CO. (Inc.). Indianapolis.

THE STANDARD

INSURES YOUR MAIL BEING SEALED SECURELY AND NEATLY. YOUR MAIL CATCHES THE EARLY TRAIN

Table showing the comparative operating cost per annum between the STANDARD and any power sealer retailing at $100.00.

The Standard, Model F Costing $25		Any Electric Sealer Costing $100
$5.00	Depreciation based on machine becoming obsolete in 5 years	$20.00
2.50	Repairs, parts, etc., 10% of initial cost	10.00
0.00	Electricity, based on electric sealer being used only ½ hour per day at 10c per hour	15.00
1.50	Loss of interest on investment at 6% per annum	6.00
$9.00	Total annual operating cost	$51.00

Showing a difference of $42. per annum in favor of the STANDARD, equal to nearly double its initial cost. No allowance has been made in the above table for the fact that owing to its SIMPLICITY and EASE OF OPERATION, the STANDARD can be operated by YOUR MOST INEXPERIENCED OFFICE HELP. We are anxious to prove our claims in a competitive test IN YOUR OWN OFFICE AT OUR EXPENSE.

Write for Demonstration to

UTICA SALES & SPECIALTY CO., Inc., UTICA, NEW YORK

E. SCHMATOLLA
Consulting, Designing & Constructing
Engineer and Patent Attorney
To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares.
150 Nassau St., New York, U. S. A.

The Yates Patent Down-Draft Kiln Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Virtified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

ALFRED YATES,
SHAWMUT, PA.

DENNIS SYSTEM OF KILNS AND DRYERS.

(Patented.)

Down-draft kilns that give results. Walls are battered. Arches built by a new method, which overcomes all danger of arches falling. They will burn all hard brick with less fuel than other down-draft kiln of the same capacity; built with either single or double arches up to a half million or more. Stronger and cheaper to build than other kilns the same size. Many in use in different parts of the country. Easy to operate.

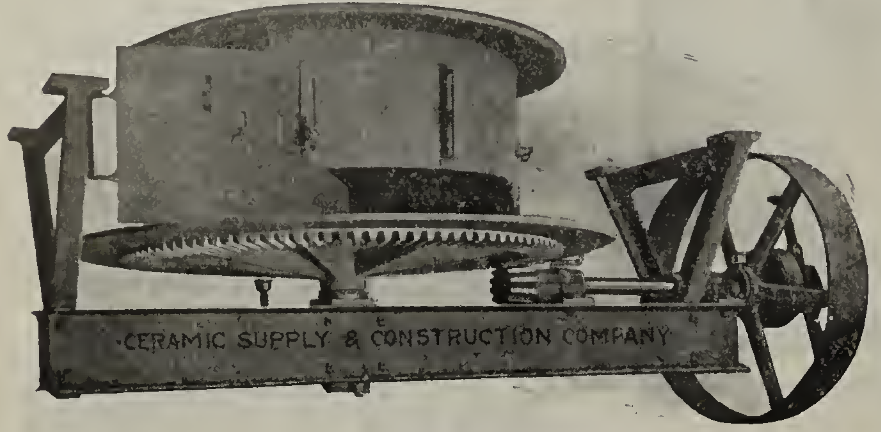
Plans for tunnel dryers for either the car system or the Steel Pallet and Lift Car System.

For testimonials and further particulars address,

F. W. DENNIS,
1052 Bermuda St. Norfolk, Va.

Brick manufacturers who have anything in the way of second-hand machinery or appliances, will find a ready market for same through a card in our Classified Advertisements. Superintendents, yard foremen, burners, etc., desiring to make a change, will do well to run a Wanted ad in our classified department. Clay-Worker ads bring results.

BOLT IT TO THE BIN!



Investigate the

COLUMBUS CLAY FEEDER

for

DRY PAN and PUG MILL.

"O. K. in every respect, and considered one of the most important machines on our plant."

—*Extract from one of many letters.*

Write for particulars!

CERAMIC SUPPLY & CONS. CO.

COLUMBUS, OHIO

SCREENS
ELEVATORS AND CONVEYORS
OHIO DRAFT GAUGE

The Crosby Dryer

A practical, inexpensive dryer that has proven in actual practice that it saves time, money and worry.

A continuous dryer, heated by radiation and ventilation, with the temperature and humidity under control at all times.

Uniform increase of temperature and decrease of humidity from receiving to discharge end of dryer. Highest economy of fuel and operation, and lowest installation cost. Does not require track, dryer cars, brick work, fans, stacks, fire-box or flues.

We invite correspondence.

Crosby Dryer Company

105 West Monroe Street

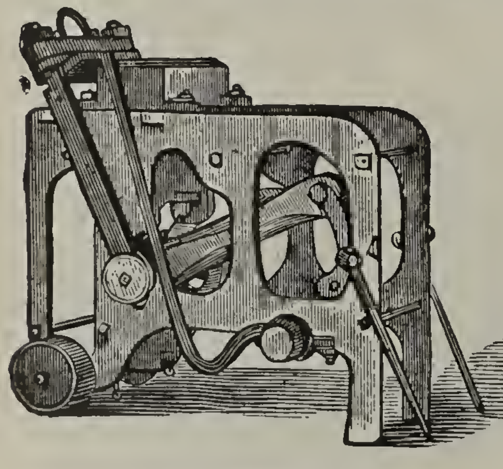
Chicago, Ill.

Patent
Pending

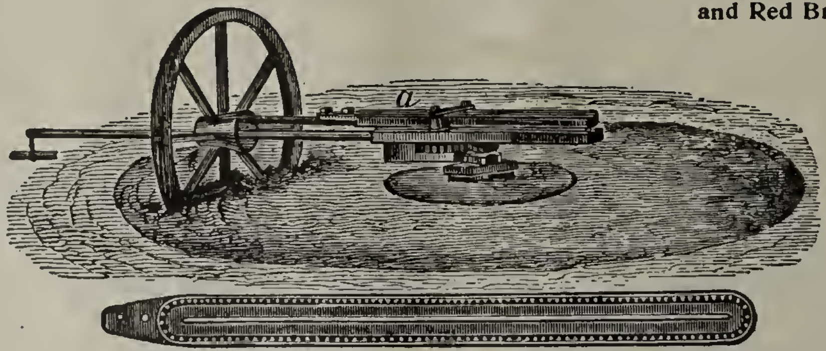
Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



RED BRICK PRESS.

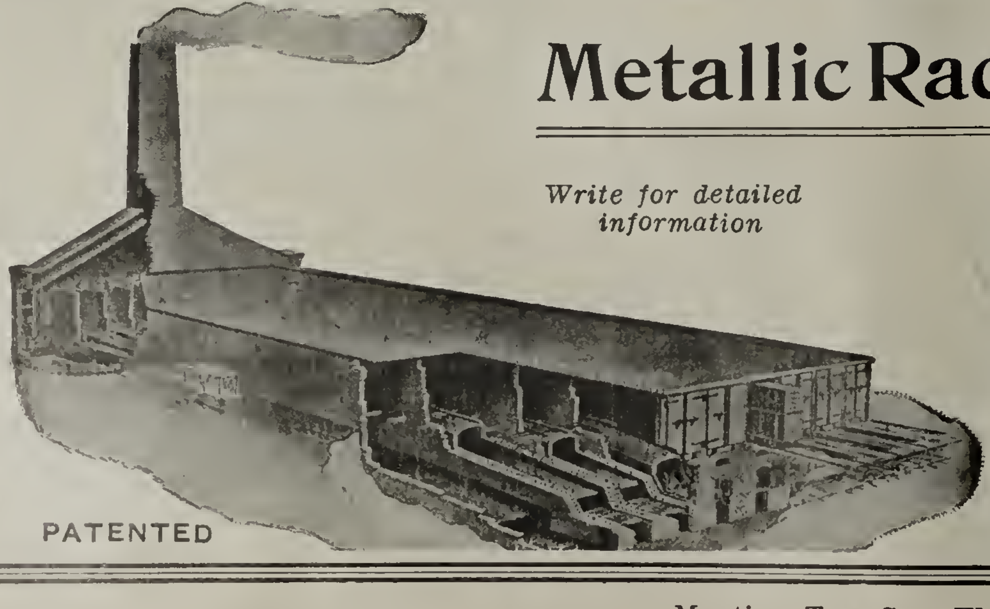


These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞ Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

Metallic Radiation Heat Dryers



Write for detailed information

PATENTED

IMPROVED KILNS AND DRYERS

KILN FLOORS AND FURNACES

Brick & Clay Engineering Co.

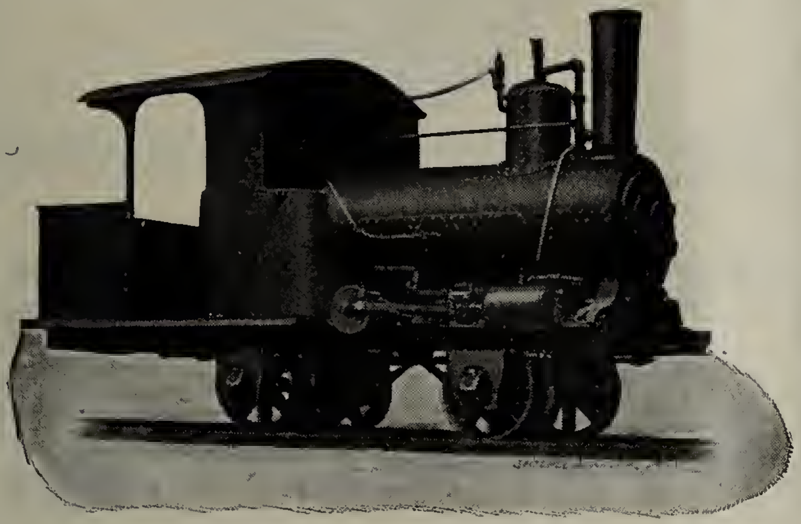
(Inc.)

5116 Walnut St. Philadelphia, Pa.

INDUSTRIAL LOCOMOTIVES

TWO SIZES

5 TON AND 12 TON.



All metal construction, including cab.

Double chain driven. Steel roller chains and cut steel sprockets. Low in first cost and inexpensive to maintain and operate.

The last word in economical clay transportation.

DEWEY BROS., Inc., Goldsboro, N. C.

ELLIS LOVEJOY

Consulting Engineer

COLUMBUS, OHIO

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Geological Examination of Properties

Clay Testing

Investigation of Manufacturing Propositions

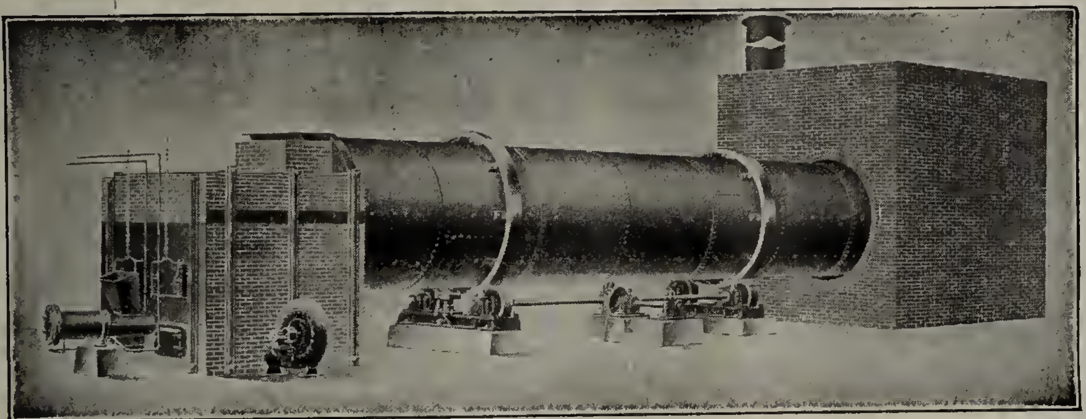
Plants Designed, Construction Superintended and Operations Directed

Dryers, Furnaces, Kilns

Remodeling Old Plants Given Special Attention

Development of New Lines of Products

Appraisal of Plants



ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON.

It Assures Uniform Product.

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.

68 William Street
NEW YORK

"OHIO" ROLLED EDGE STEEL BRICK PALLET.

Style No. 8. For Rack Cars.

(Patented.)

Made from No. 13, 14, 16 or 18 Gauge Steel. ⅝-inch Roll running full length and across ends. Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING COMPANY, Niles, Ohio.

LABOR REDUCED
COST REDUCED
QUALITY INCREASED
QUANTITY INCREASED
by using

The National Steam Drier

Ask us about it.

The National Dry Kiln Company
1117 East Maryland St.
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GOLD MEDAL AWARD

PANAMA PACIFIC EXPOSITION
for

THWING
HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

Their Merits Are Vouched for by Hundreds of Satisfied Users.

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THE ELWOOD BRICK PRESS
MADE BY
THE CHICAGO BRICK MACHINERY CO.
NO. 801. CHICAGO, ILL. PAT. PEND.

ELWOOD PRESS

BUILT FOR HEAVY DUTY.
ALWAYS MAKES GOOD.

WE ALSO HANDLE EVERYTHING USED ON A BRICKYARD.

CHICAGO BRICK MACHINERY CO.
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Sold Also by
MANUFACTURERS EQUIPMENT CO.
Dayton, Ohio.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

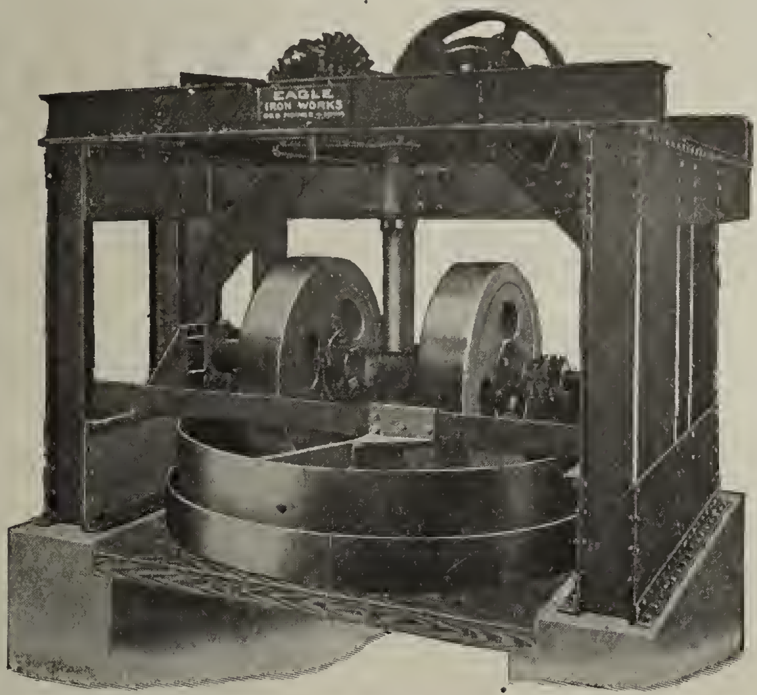
Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

A New Candidate for Favor!
Right in Every Way!



The 8 Foot Steel Frame Dry Pan

Built by the

EAGLE IRON WORKS
Des Moines, = Iowa

Type 0 Thew Loads Clay for 264,000,000 Brick in 9 Years
Type 3 Thew Loads Clay for 397,500,000 Brick in 15 Years

The above mentioned THEW is now loading clay for 120,000 brick per day, 300 days per year, at the "F" Plant of The Farr Brick Company, Cleveland, Ohio.

The type 3 referred to is now loading clay for 150,000 brick every day at the "G" Plant of the same company.

A TYPE 1 THEW, IN ITS ELEVENTH YEAR OF CONTINUOUS SERVICE in one of the plants of The Barkwill Brick Company, Cleveland, O., LOADED CLAY for 31,000,000 BRICK in 1915. The engineer reports that they were SHUT DOWN BUT ONE HALF DAY during that time.

Over 300 brick manufacturers, in all parts of the country, are sending in similar testimony daily.

No wonder the owner wrote, after nearly 25 years of service, as follows: "Our shovel is not very handsome to look at, but it does its work without any trouble. I can't say anything too good for the shovel or the Thew Company." This shovel is shown in the cut.

There are certain fundamental principles in the Thew design that account for this ability to give maximum and continuous service at a minimum maintenance cost.

Buy a THEW and FREE YOURSELF from LABOR TROUBLES and the reduced output incident thereto.

WRITE FOR CIRCULAR 22-F AND LIST OF THEW OWNERS

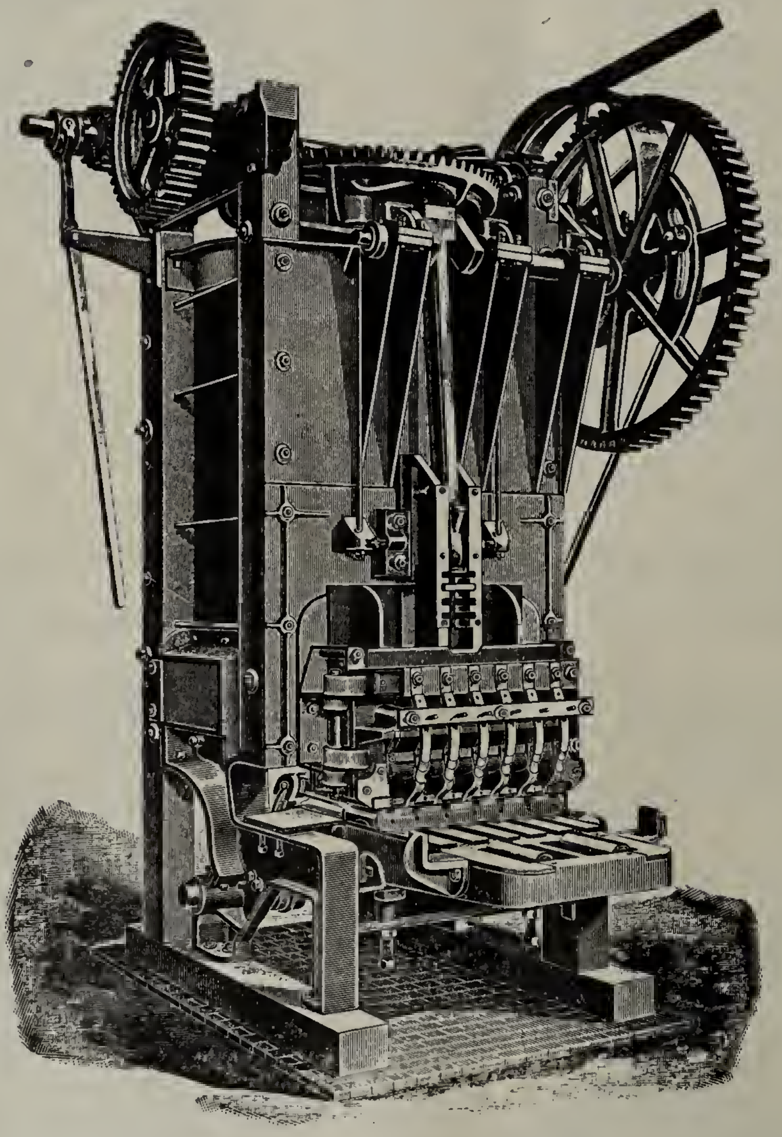
THE THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

Every Buyer of New Haven Machines a Satisfied User

The "New Vertical" Brick Machine is the most substantial Upright Soft Clay Brick Machine in the world

We manufacture a full line of supplies including

- Pug Mills,
- Clay Crushers,
- Clay Elevators,
- Winding Drums,
- Tempered Steel Brick Strikes,
- Clay Cars,
- Brick Trucks,



- Stamp Mills,
- Freight Elevators,
- Friction Clutches,
- Clutch Pulleys,
- Revolving Dump Tables.

"NEW HAVEN" VERTICAL BRICK MACHINE.

In fact we can furnish machinery of the most improved modern construction for brick manufactories of any capacity. Competent workmen are employed in every department, hence we can guarantee our machinery to be well made and capable of performing the work for which it was designed.

The EASTERN MACHINERY CO.

NEW HAVEN, CONN.

JOIN THE

BOOST

BUILD WITH BRICK

BOOST

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

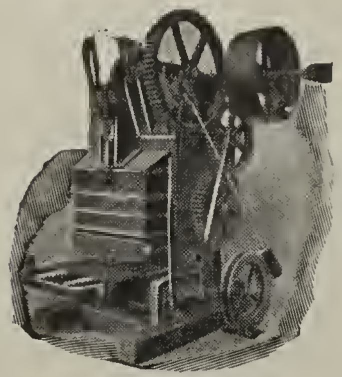
You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

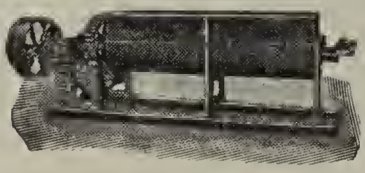
(Cross out the items not wanted, fill in and mail us the coupon.)

Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

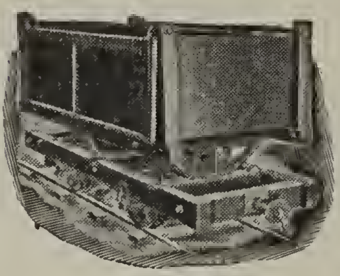


Vertical Brick Machine

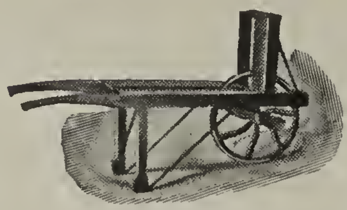
Style "A" and "P" Disintegrator



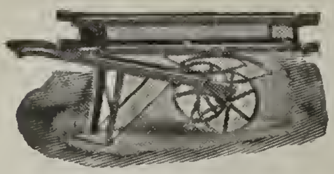
Double Geared Pug Mill



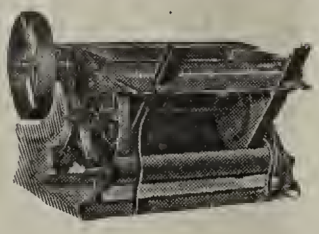
Side Dump Car



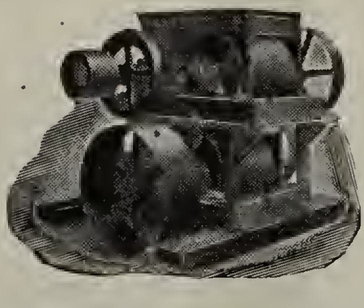
No. 6 Barrow



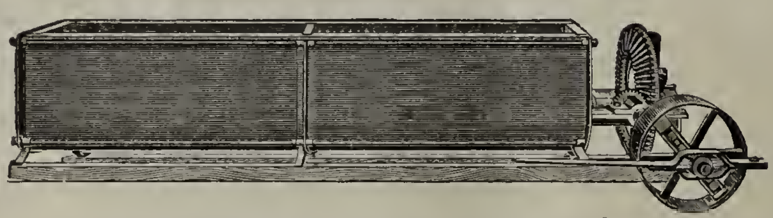
Double Deck Truck



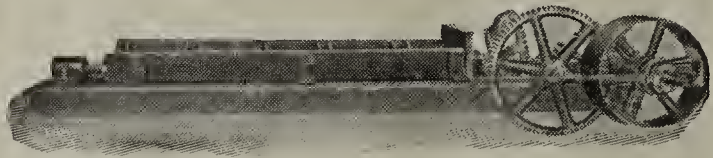
Style "A" Mould Sander



Style "P" Compound Disintegrator and Crusher

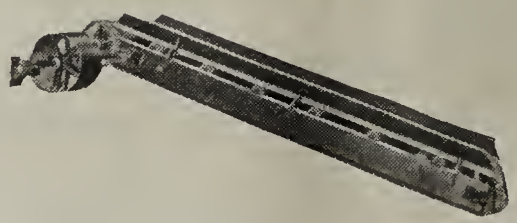


Single Geared Pug Mill



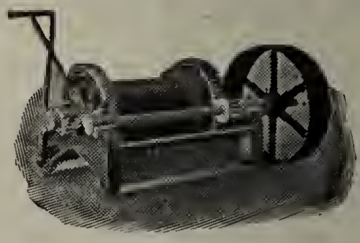
Feeder or Granulator

The Potts Rocker Grate
For any size fire box on boiler or kilns

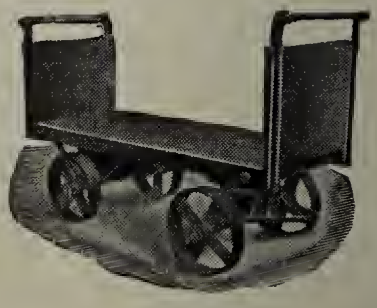


Clay Elevator.

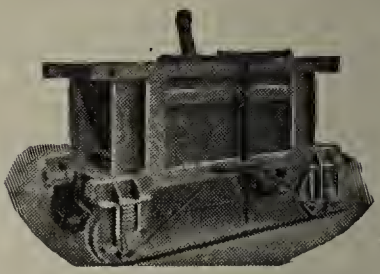
Style "P" Roller-Crusher



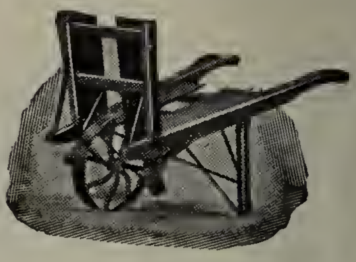
Style "B" Winding Drum



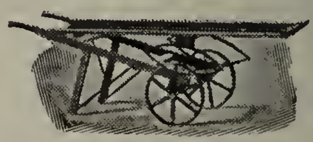
Mule Truck



Bottom Dump Car



No. 2 Barrow



Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for Prices.

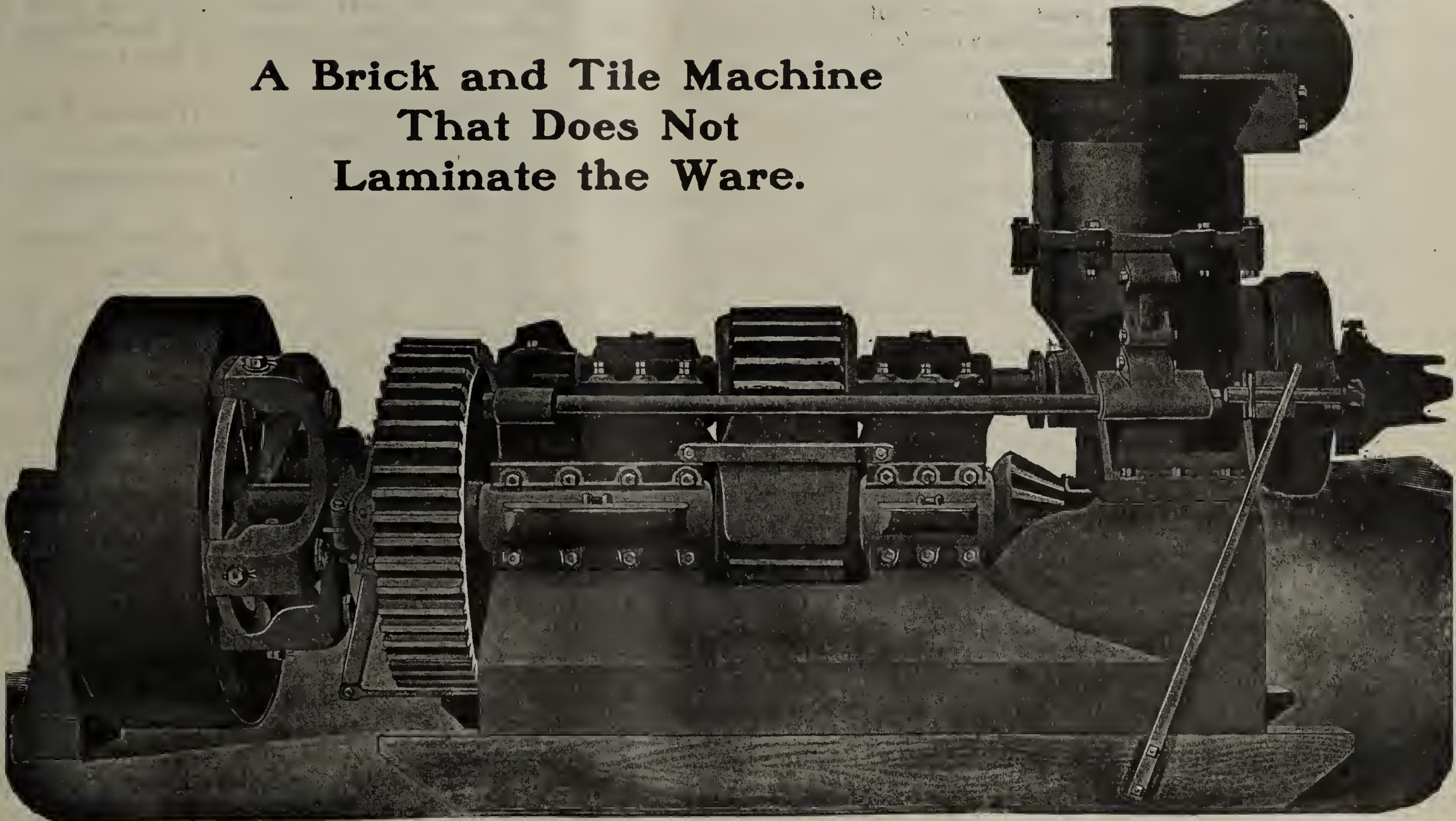
If it's to be Had We Have it.

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

**A Brick and Tile Machine
That Does Not
Laminate the Ware.**



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

THE WALLACE MFG. CO.

FRANKFORT, IND.

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clay Glazes and Enamels, by Henry R. Griffen. Price $5.00.

With a supplement on "Crazing, Its Cause and Prevention," giving full instructions for glazing and enameling brick, terra cotta and pottery, including exact recipes and formulas for all the principal colors in use, and also instructions for their preparation and application.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

The Effect of Heat Upon Clays, by Prof. A. V. Bleininger. Price $2.00.

A book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent.

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A book in which the reader is introduced to HOLLOW TILE in the making; how it is wrought into houses, etc., and is profusely illustrated with 215 designs.

Land Drainage, by J. L. Parsons. Price, $1.50.

A treatise on the design and construction of open and closed drains.

Radford's Brick Houses and How to Build Them, by Wm. A. Radford. Price, $1.00.

Replete with new and artistic designs for brick houses, apartments, stores, etc., together with instructions in the manufacture of brick and its practical uses as a building material.

Vitrified Paving Brick, by H. A. Wheeler, E. M. Second Edition. Price $2.00.

A review of present practice of the manufacture, testing and uses of vitrified paving brick.

Tables of Analyses of Clays, by Alfred Crossley. Third Edition. Price $2.00.

Including analyses of chemically pure clays, well-known common and pressed brick clays, paving brick clays, fire clays, shales, etc., both in this country and abroad. A valuable book for those desiring to compare their clays with well-known and standard clays.

Engineering for Land Drainage, by C. G. Elliott. Price $2.00.

Giving instructions for laying out and constructing drains for the improvement of agricultural lands intended for the use of those who are charged with the responsibility of making plans for and executing drainage improvement.

Practical Farm Drainage, by C. G. Elliott. Price $1.50.

A Treatise on the Benefits of Farm Drainage, with plans and illustrations for making and laying tile.

Economies in Brickyard Construction and Operation, by Ellis Lovejoy, E. M. Price $1.00.

Points out economical methods for every department of the business. Is practical and covers the field thoroughly.

Scumming and Efflorescence, by Ellis Lovejoy, E. M. Price, 50 Cents.

A book of authority, giving the cause and remedy of scum and efflorescence.

Tile Underdrainage, by J. J. W. Billingsley. Price 25 Cents.

A brief treatise on the benefits of farm drainage by the "Father" of farm drainage. This is an excellent pamphlet for distributing among tile users. In lots of 100, $2.50; in lots of 1,000, $20.00.

Drying Brick, by W. D. Richardson. Price 25 Cents.

A little booklet giving and explaining the various styles of dryers, etc.

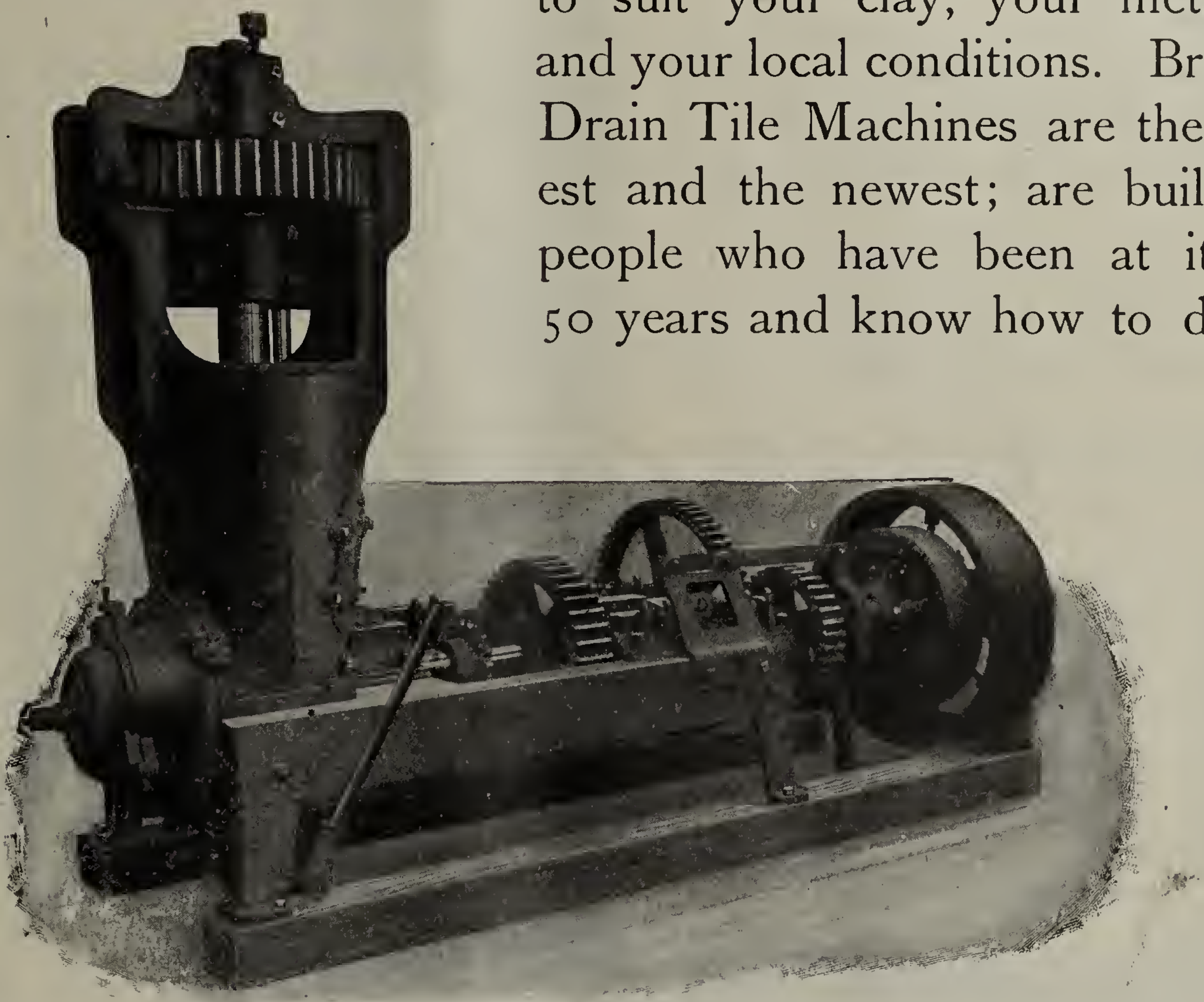
T. A. RANDALL & CO.

Indianapolis, Ind., U. S. A.

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

DRAIN TILE MACHINES

We build and guarantee both upright and horizontal patterns in several sizes, and can furnish you with just the proper machine to suit your clay, your methods and your local conditions. Brewer Drain Tile Machines are the oldest and the newest; are built by people who have been at it for 50 years and know how to do it.



We also build Horizontal Brick Machines, Automatic Cutters, Crushers, Pug Mills, Feeders, Dry Pans and a full line of stiff-mud machines.

ASK FOR COMPLETE CATALOG.

H. BREWER & COMPANY, Tecumseh, Mich.

**HERE IS
A
KILN
THAT WILL
DO AWAY
WITH
YOUR
KILN LOSSES**

The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

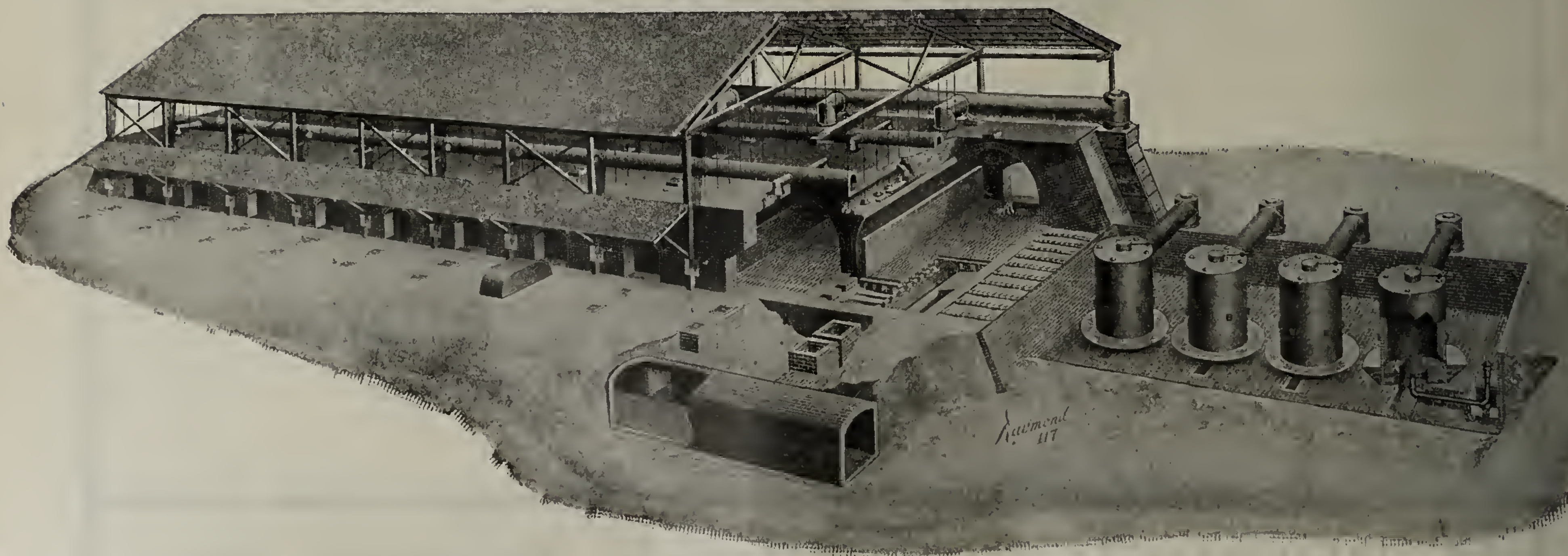
That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

International Clay Machinery Co.

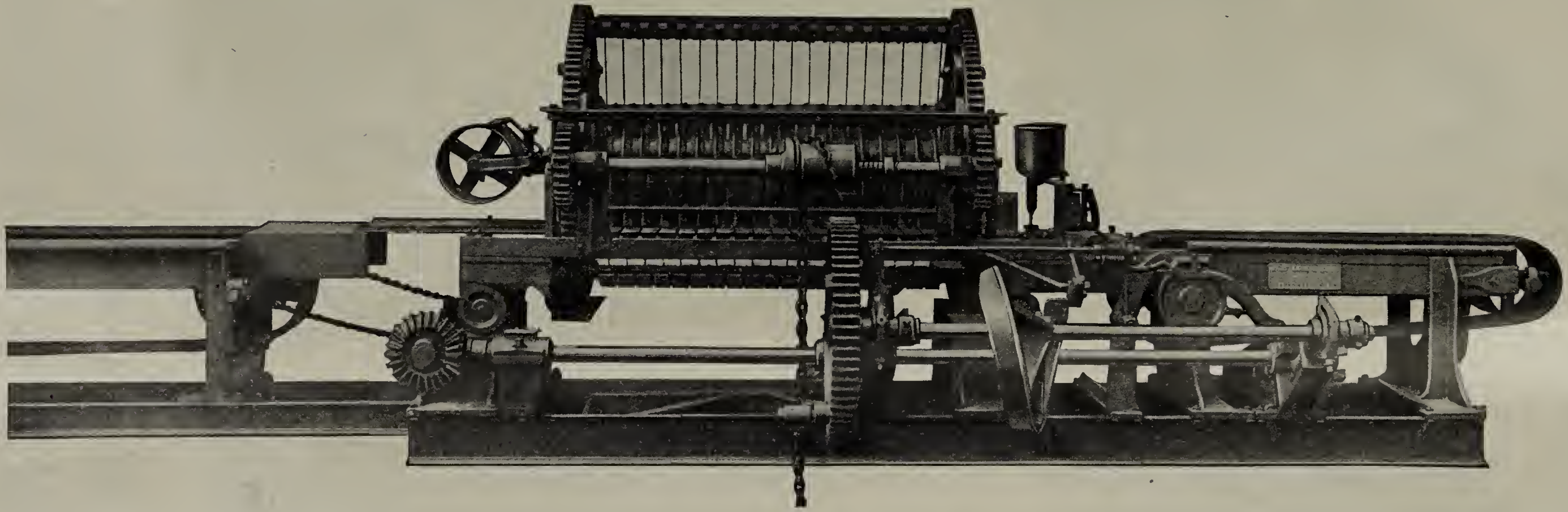
Dayton, Ohio, U. S. A.



The Producer Gas Fired Continuous Kiln

Steele's New No. 18 Automatic Side Cutter

Capacity 15,000 brick per hour. Weight 6,000 lbs.



The power is applied to the reel so as to offer no resistance to the carriage. In fact, it helps start it moving.

The reel is driven by crank motion, which gradually starts and stops it, eliminating shocks and jars.

The back platens are fitted with spring jaws, to prevent breakage of wires.

The best wire suspension known, making possible effective wire cleaners.

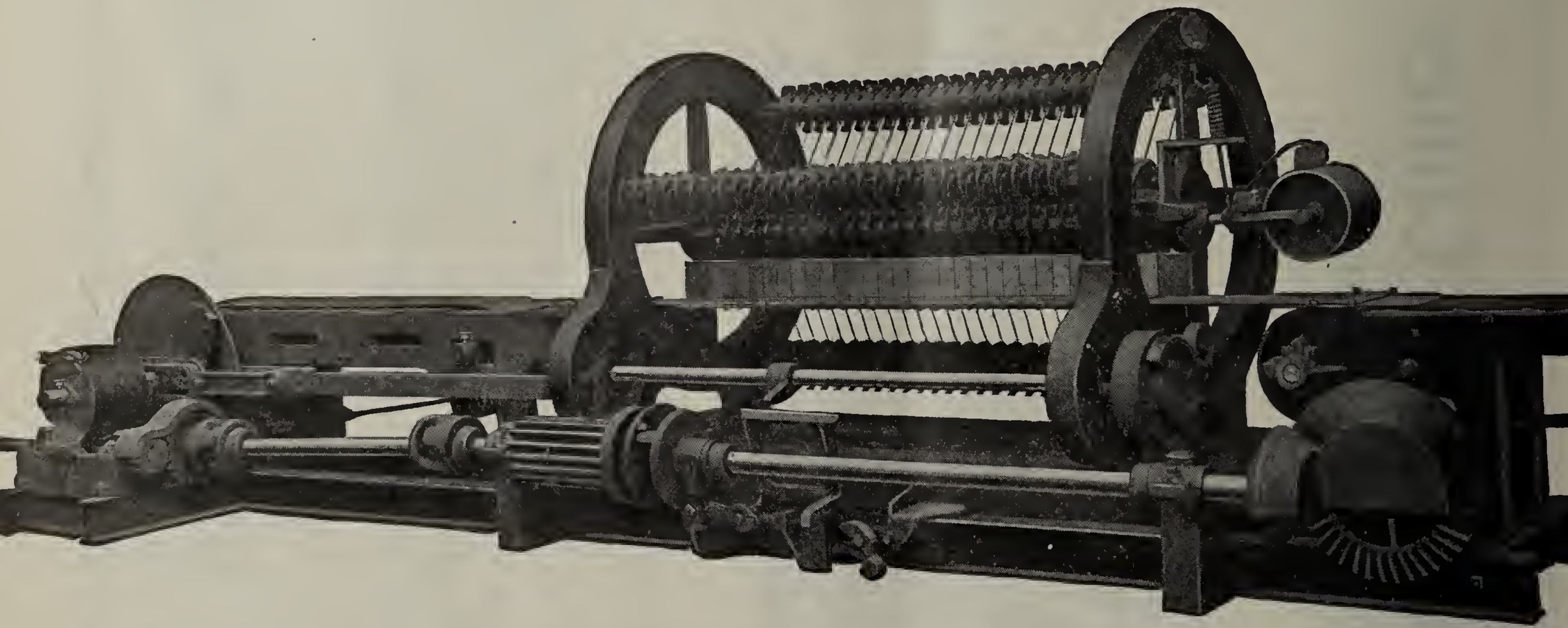
This cutter solves a hard problem in the most effective way yet attained, especially in very large capacities.

Investigate.

J. C. STEELE & SONS, Statesville, N. C.

Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

WHICH IS THE BETTER CUTTER?



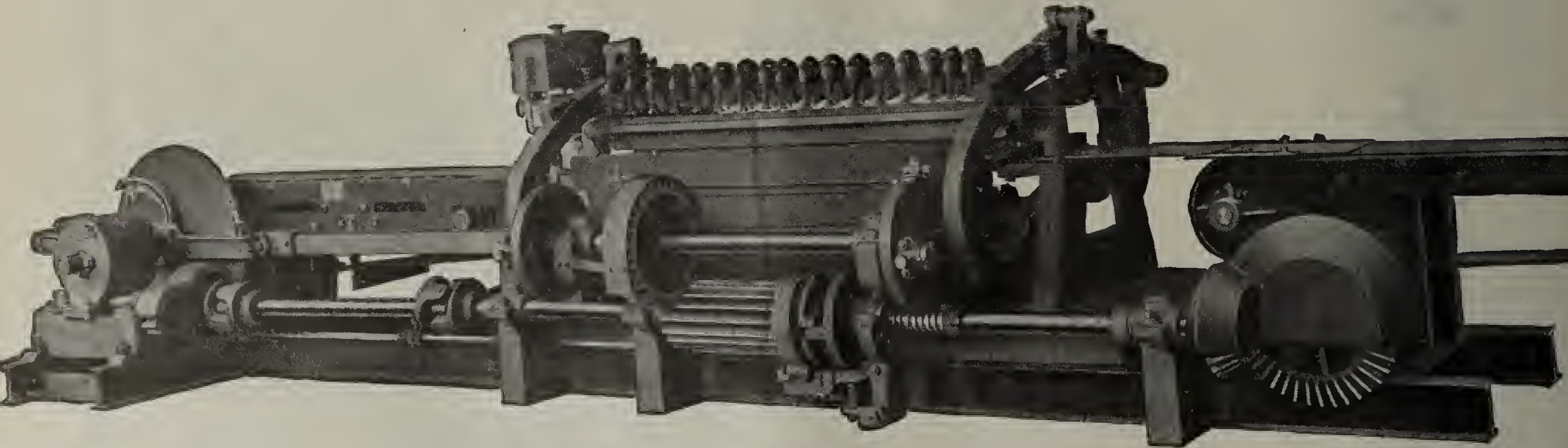
Freese Rotating Automatic Cutter.

It would be difficult to judge which of these two cutters is better liked, for every user seems to most favor the one he operates.

The rotating cutter, used and endorsed by a large percentage of the face brick manufacturers for its success in producing the highest grade unrepressed front brick, is equally well liked by common brick manufacturers——

And the reciprocating cutter, in operation on every plant manufacturing Dunn Wire-Cut-Lug Pavers, is selected by many manufacturers of repressed pavers and builders because of its ability to produce—continuously—perfectly straight brick, even at high capacity.

Both cutters are truly automatic—They require no special attention.



Freese Reciprocating Automatic Cutter.

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

Mention The Clay-Worker.

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Sixty-Three
Years
The Name

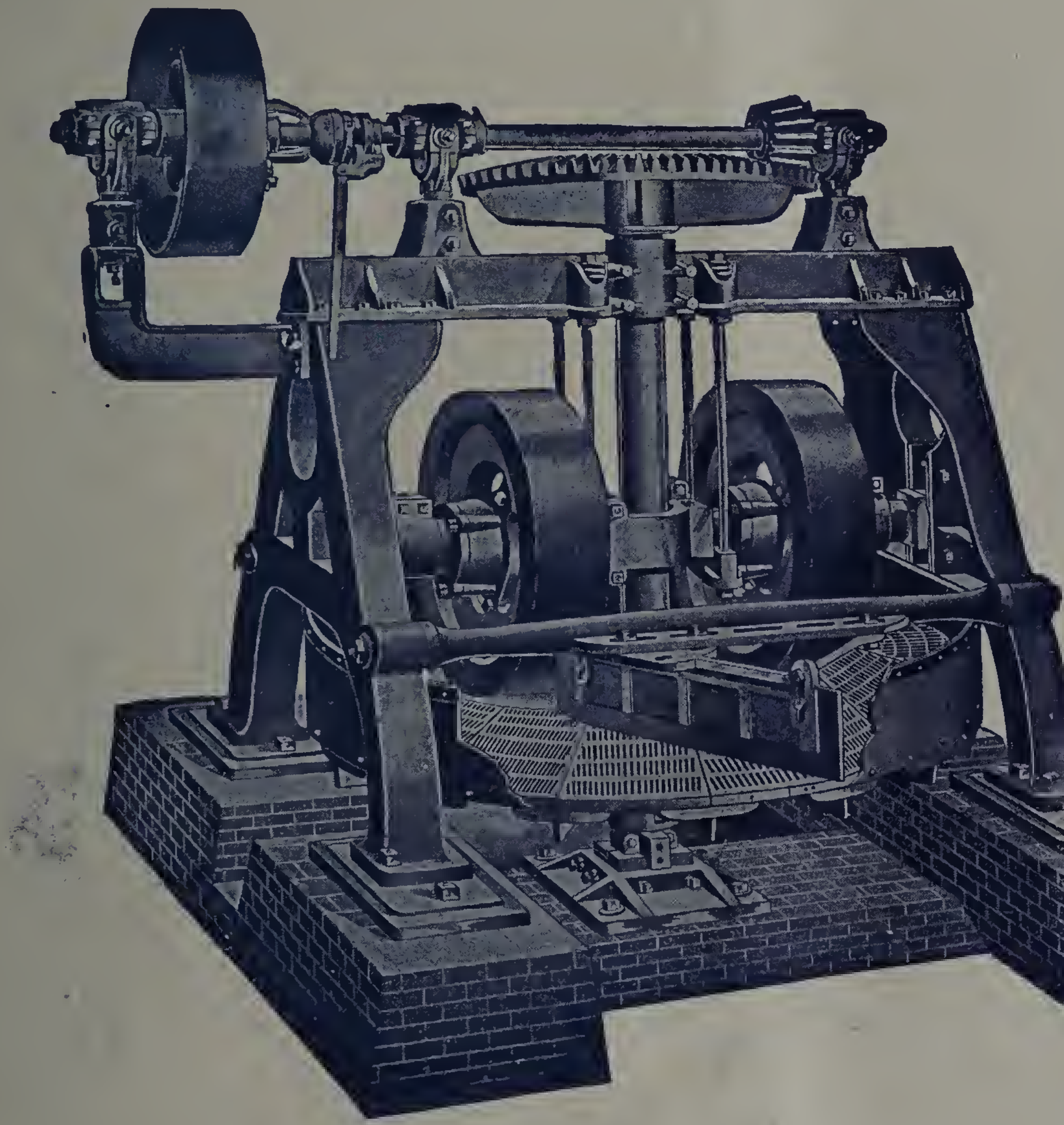
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



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a complete line of
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Pressures, Side and
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Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.

The Wise Man of FATE

This Free Book

Tells How

The Alliance Clay Products Co.

Finds Plymouth Locomotives Cheaper Than a Steam Locomotive for Hauling Material Between Shale Bank and Mill---Doing More Work and Cutting Costs in Half.

It is a most valuable book for any Clayworker. In his own words in this book, Manager J. B. Wilcox, of The Alliance Clay Products Co., of Alliance, Ohio, tells a most convincing story of how he solved his haulage problem, backing his statement with proof in the way of cost data and other information. Mr. Wilcox is convinced that—

The Plymouth

Gasoline Industrial Locomotive

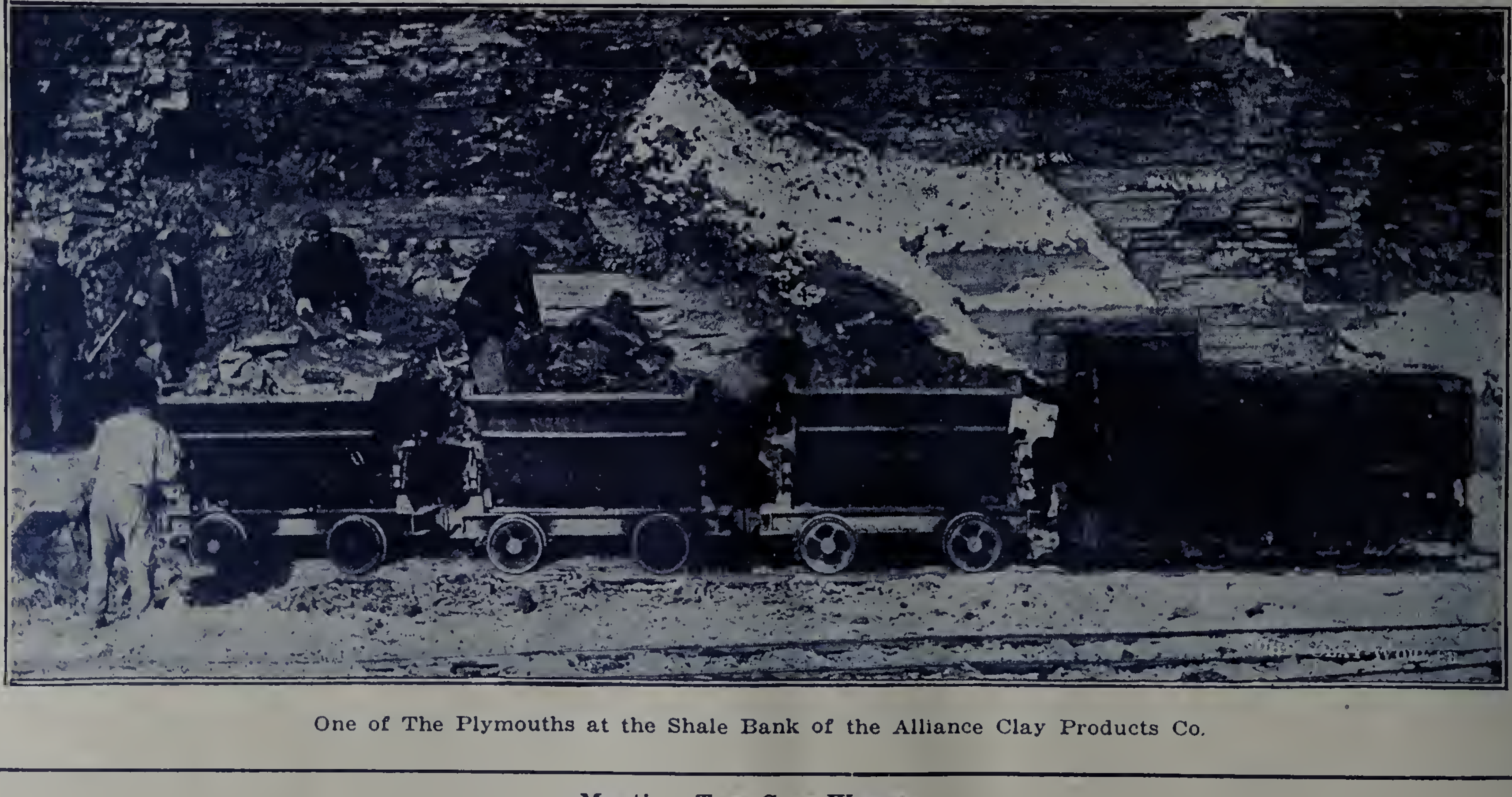
Has These Six Points of Superiority

1—It is cheapest to buy.
2—It is cheapest to install.
3—It is cheapest to operate.
4—It is cheapest to maintain.
5—It has greater draw-bar pull.
6—It has greater traction pull.

Every Clayworker Should Have This Book

It is for the small plant owner as well as the large, and should be in your hands for reference whether you contemplate remodeling your haulage system now or in the future. It has 96 pages of valuable information, fully illustrated, giving proof and descriptions of many other Plymouth installations besides that of The Alliance Clay Products Co. Send for your copy of the book today—it's free.

THE J. D. FATE CO., 242 Riggs Ave., Plymouth, Ohio



One of The Plymouths at the Shale Bank of the Alliance Clay Products Co.

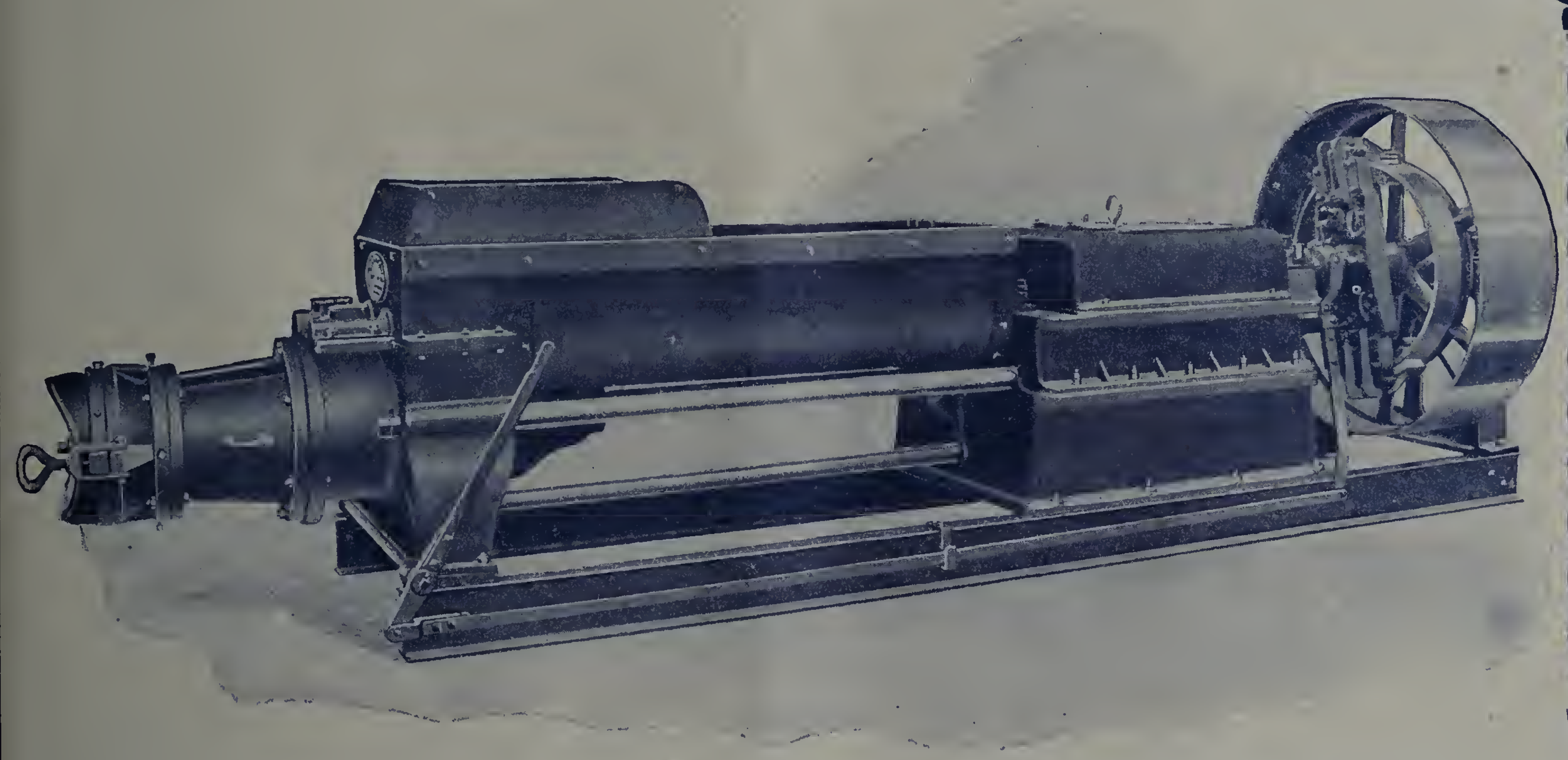
This Machine Makes 50,000 Brick or 25,000 Tile Daily

The Wise Man of FATE

Here is a machine that will increase your production and effect a great saving over other brick and tile machines. You can make from 30,000 to 50,000 standard brick per day, or from 15,000 to 25,000 four-inch drain tile, and other sizes in proportion with the—

Fate Special Imperial

Combined Brick and Tile Machine



The "Special Imperial" is a development from the well known and successful Imperial machine whose record for good results is a matter of history. In this newer machine the main auger and pulley shafts are made heavier and the machine is also equipped with a large roller thrust bearing on the auger shaft, effecting a great saving over the ordinary disc type of thrust bearing.

The machine and pulley are mounted on large "I" beams, making it entirely self-contained. It can be equipped with the different nozzles and augers for making either the large or small sizes of hollow block successfully. It is also equipped with the latest improved all-iron friction clutch pulley, which will run from 120 to 140 revolutions per minute.

Investigate These Claims

You are surely acquainted with the excellent work of the Fate Line of Clayworking Machinery. If you are not, you will find someone in or near your locality who has been using one or more of the Fate machines, which are honor-made and honor-sold. Ask us for names and addresses of those who will convince you.

THE J. D. FATE CO., 242 Riggs Avenue **Plymouth, Ohio**

GET THIS BOOK FREE

Send for the Fate Catalog of Clayworking Machinery. This is a book of valuable information which is FREE to you, it tells more about the "Special Imperial" machine and others. Check off your wants in the coupon at the right and mail it to us today.

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, Ohio.

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- ☐ Auger Brick Machinery
- ☐ Hollow Ware Machinery
- ☐ Disintegrators
- ☐ Conveyors
- ☐ Drain Tile Machinery
- ☐ Full Equipment
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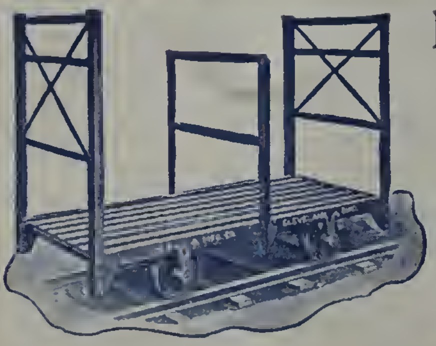

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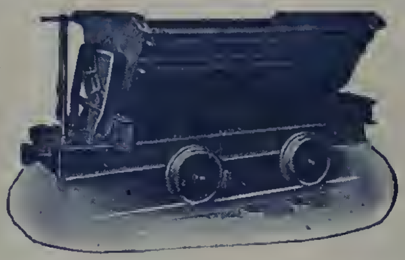
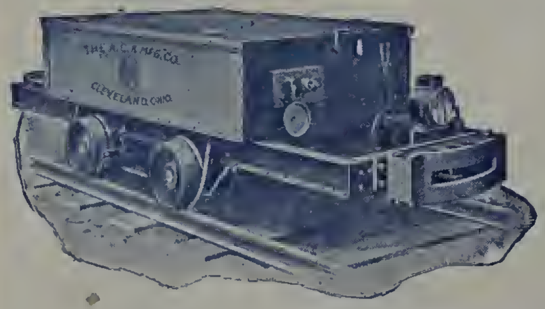
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment



Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives



Storage Battery Locomotive for general use.

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POT MOLDING MACHINERY

We specialize
Machines
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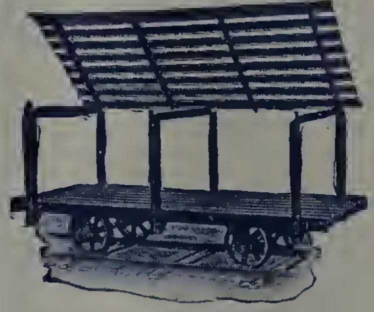
With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"



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Dryer Cars
Rack Cars
Dump Cars

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

NEW YORK PHILADELPHIA PITTSBURGH
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NOV 2 , 1916

NOVEMBER, 1916

THE CLAY-WORKER

SAFETY FIRST.---The Semi-Fire Proof "Billy" Sunday Tabernacle in Course of Construction at Boston, Mass. See page 421.

Published Monthly by
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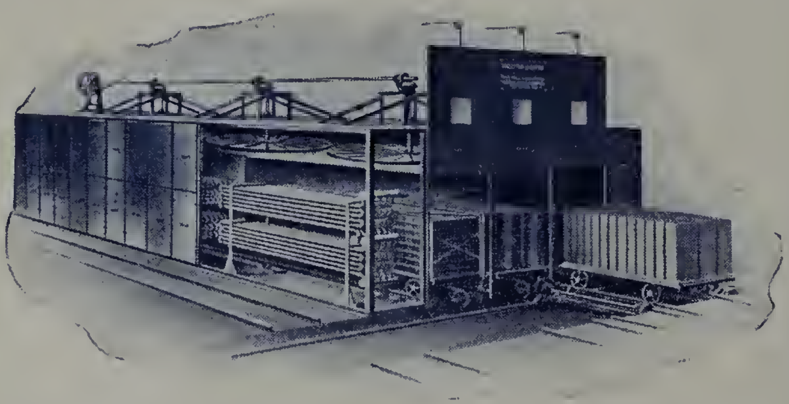
"Proctor" DRYERS

We respectfully invite you to investigate the merits of

THE



"PROCTOR" DRYER for CLAY PRODUCTS

To help you in your investigation we make the following statements of fact—not claims—

⁂

One brick plant now uses only 60 dryer cars whereas formerly they used 730, a saving of 670 cars and the space they took up.

⁂

In another plant the "PROCTOR" is safely drying nine duct conduit in 6 hours—former time 48 hours.

⁂

4-in. drain tile in 60 minutes.

⁂

Standard plastic fire clay brick in 12 hours—former time 48 hours.

⁂

You owe it to yourself to investigate this wonderful dryer that cuts down the cost and difficulty of drying.

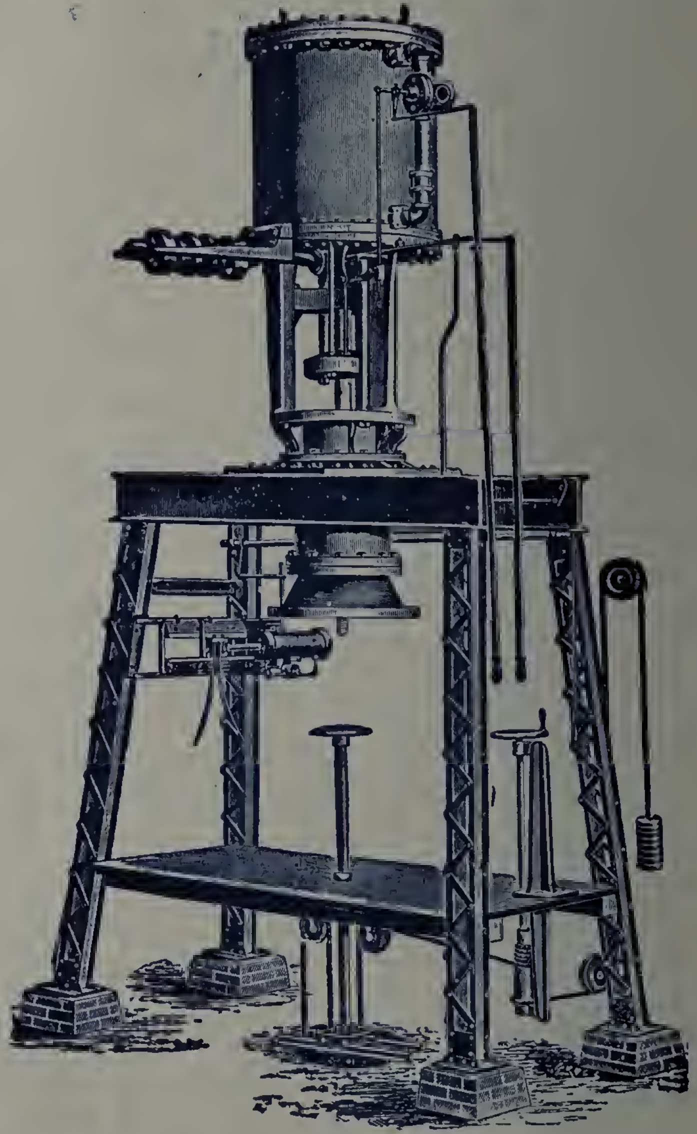
⁂

Start your investigation now—write us.

The Philadelphia Textile Machinery Co.
Philadelphia, Pa.

IT TAKES THE BEST TO MAKE THE BEST.

You cannot get a piece of steel out of a piece of lead.



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Wm. E. Dee Clay Mfg. Co.	Chicago, Ill.
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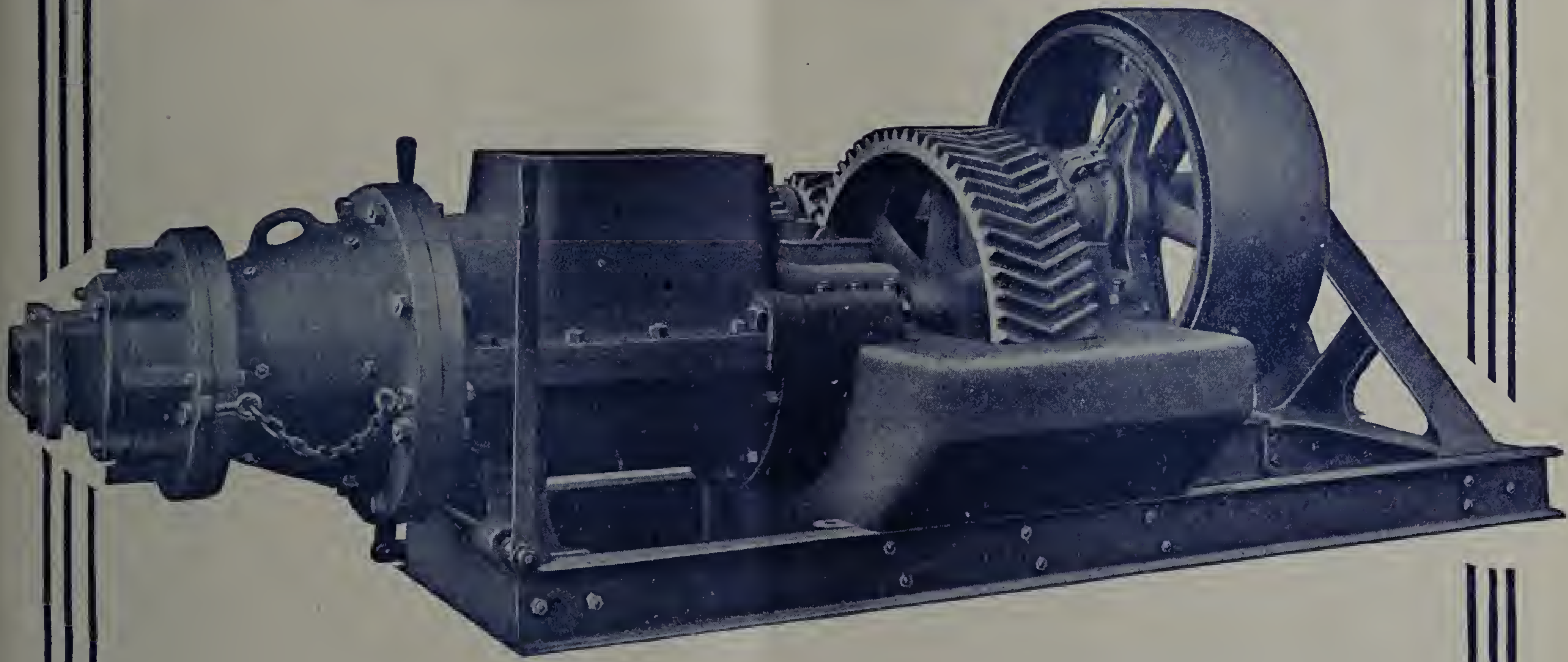
and above 150 other of the largest clayworking concerns in important commercial centers of the United States.

The Taplin, Rice-Clerkin Co.

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



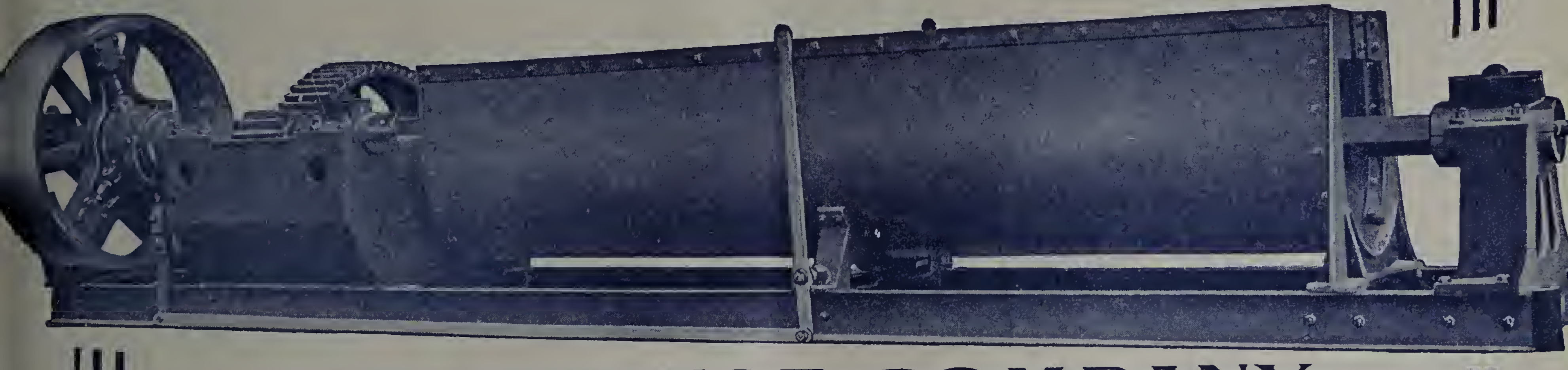
THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.



THE BONNOT COMPANY

CANTON, OHIO

909 N. Y. Life Bldg.
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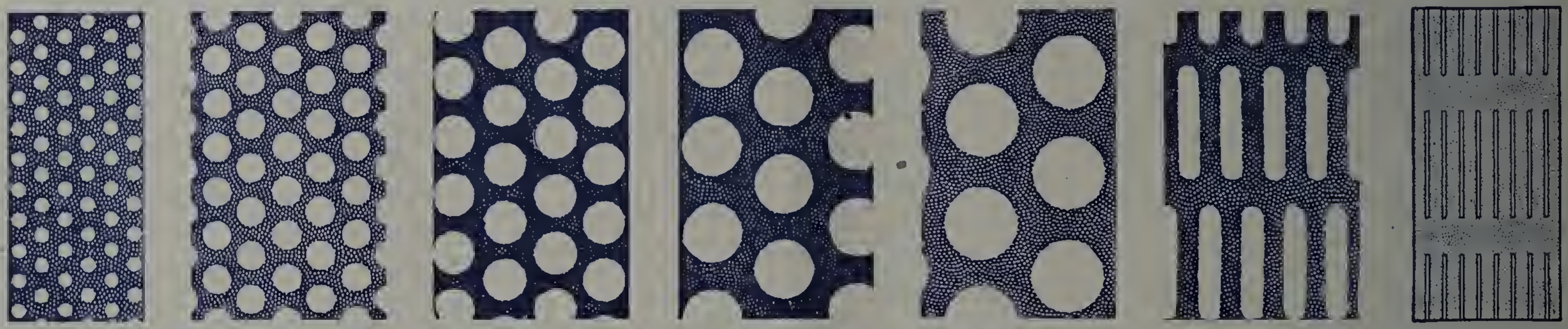
PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
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Prepare for a Busy Season and a Labor Famine!

Make Yourself Independent of Your Wheeling Gang When the Rush Comes.

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Don't wait until you are in trouble before you order an outfit of Mathews Gravity Conveyers. You cannot expect us to have a system to fit your requirements all made up ready to ship the day you order it, no matter how badly you need it. We always have orders ahead of yours, and we need time—sometimes several weeks—to catch up with an accumulation of unfilled orders. Ask us now to send the nearest representative. He will tell you what you need, the cost, and get the order on file without waste of valuable time.

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Rodgers Waste Heat Dryers

Installed in the Leading
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America, are known as

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L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
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Largest Manufacturers of Brick Drying Equipment in the United States

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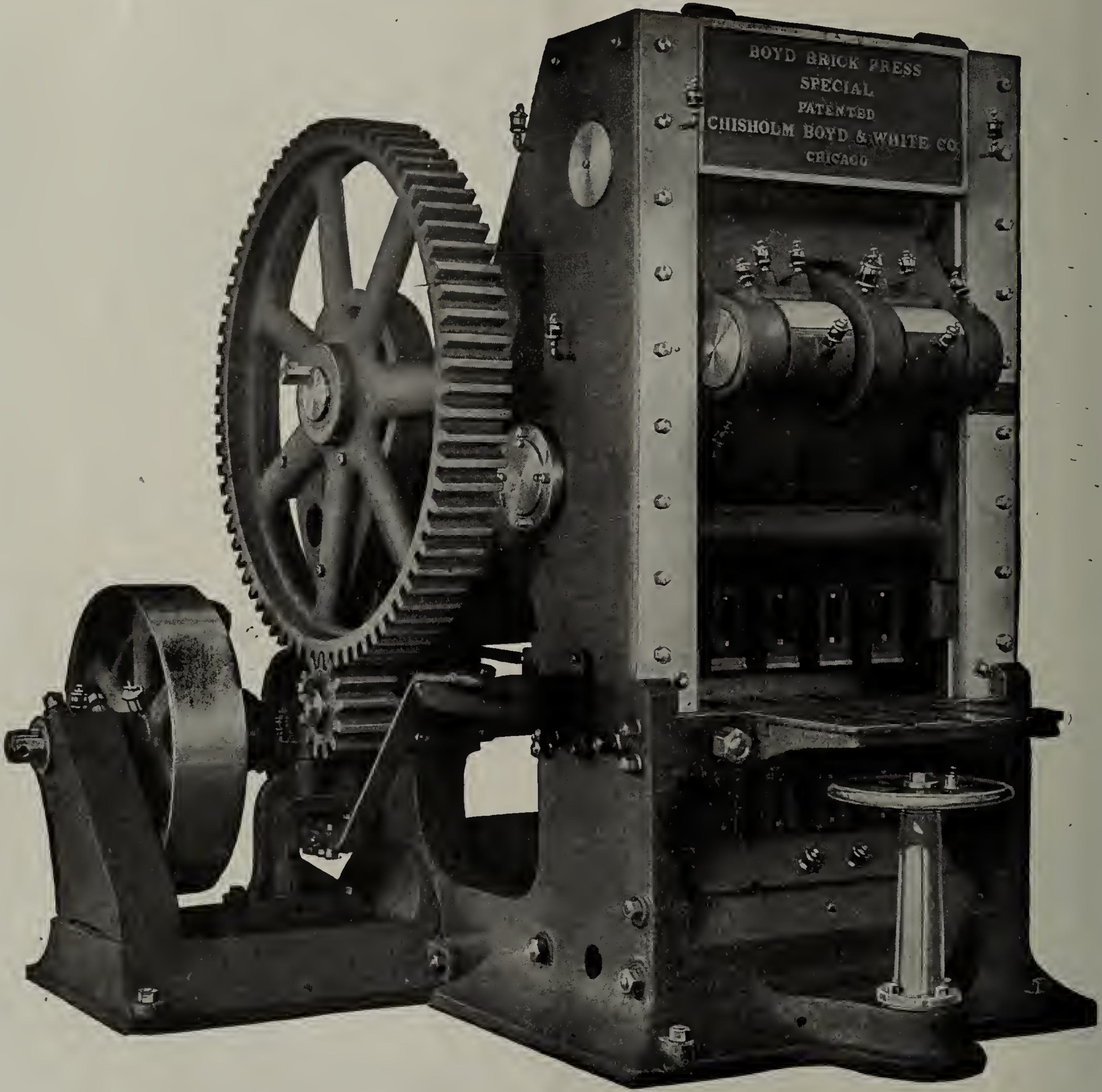
"Built Up to a Standard—Not Down to a Price."



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For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

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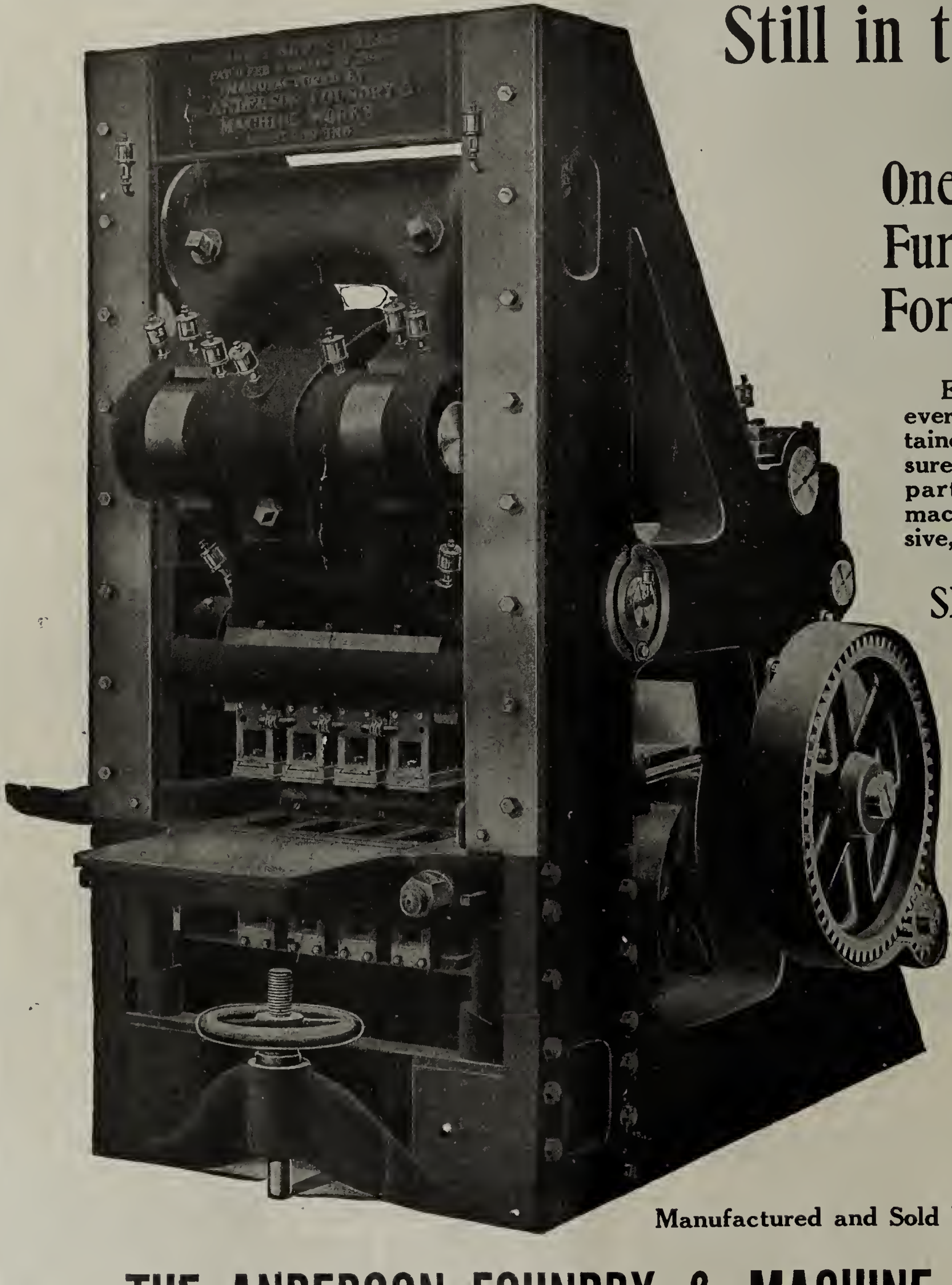

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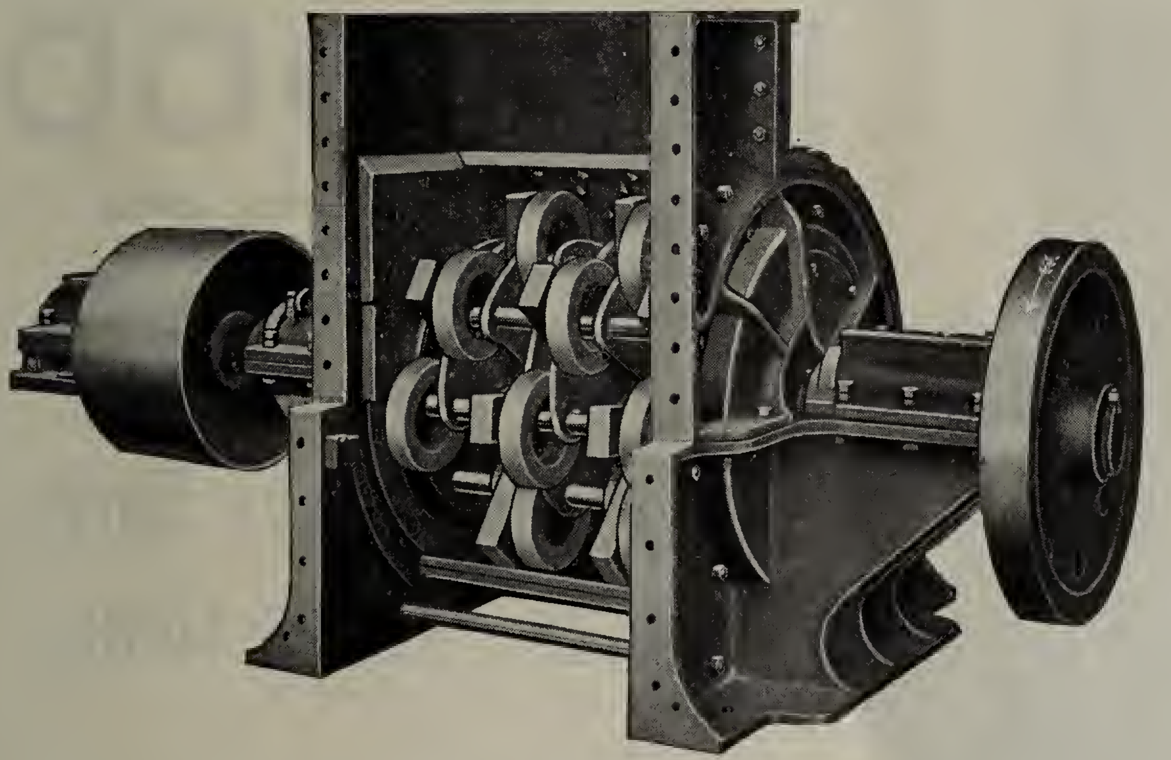

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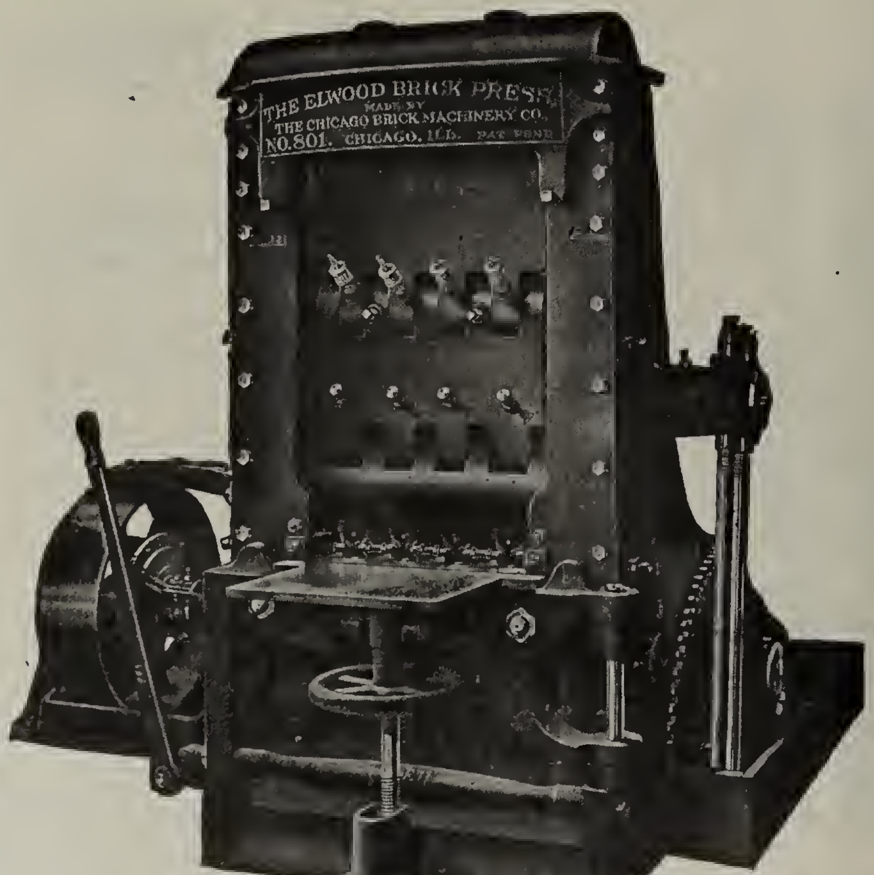
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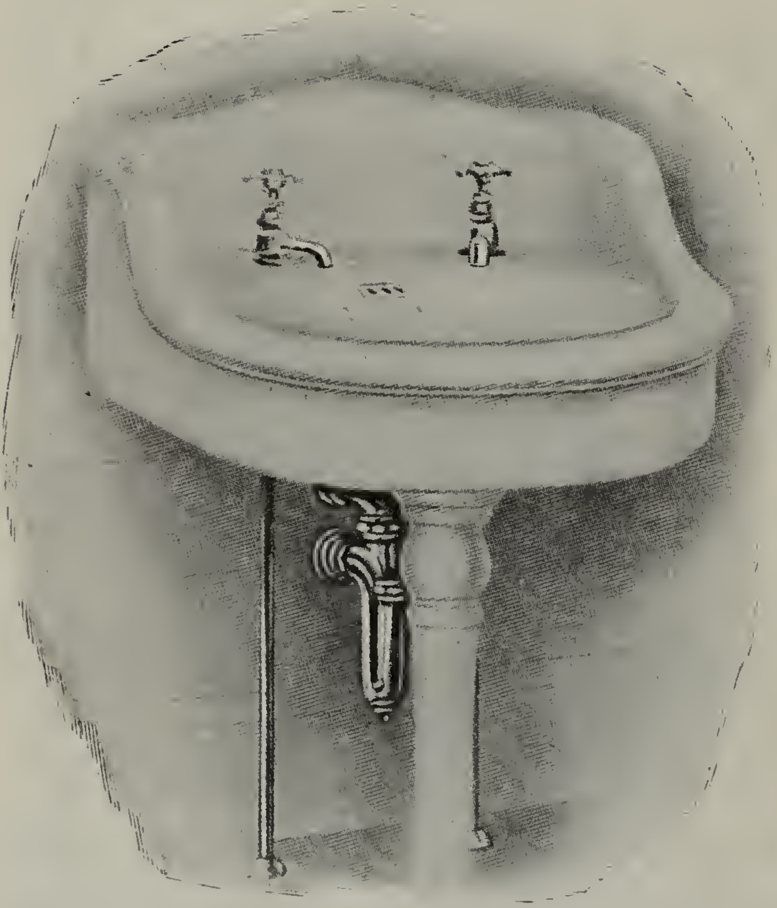

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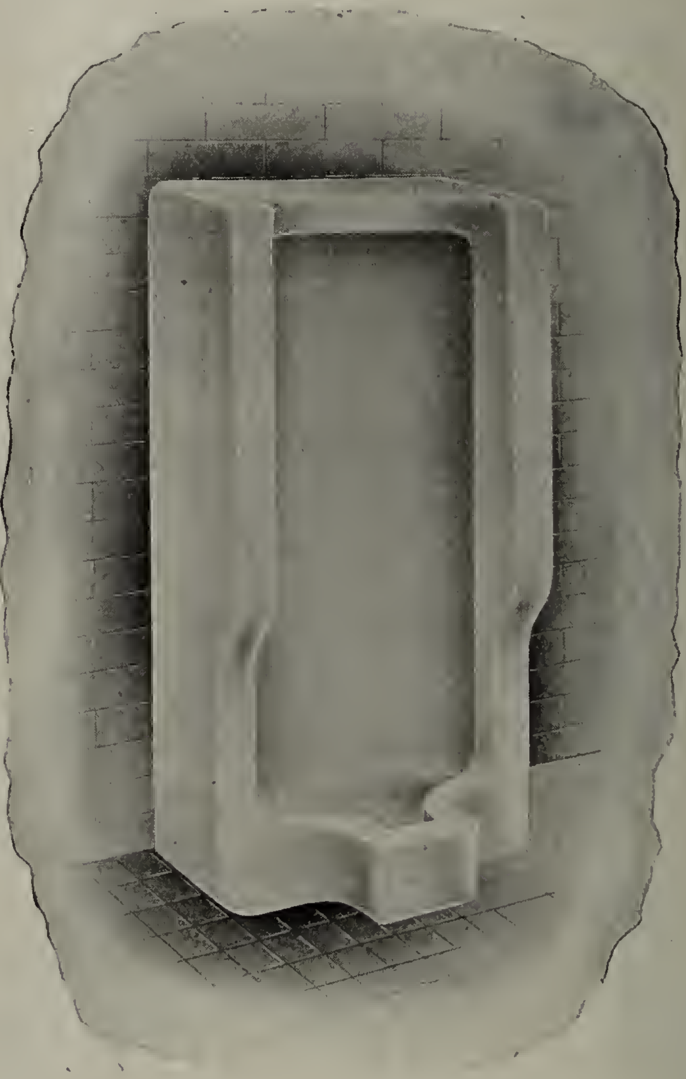

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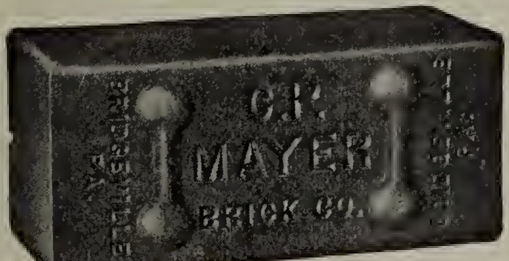

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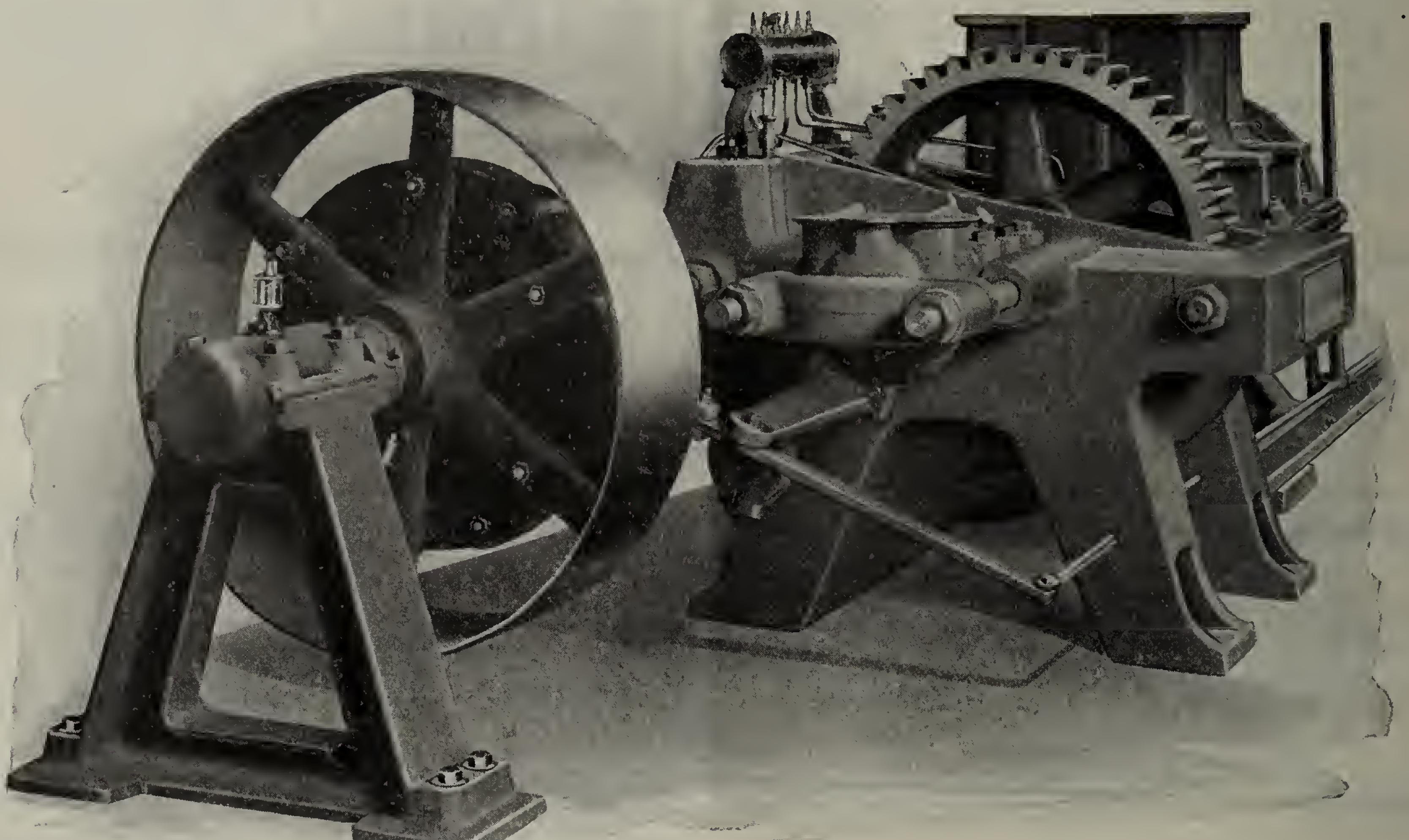

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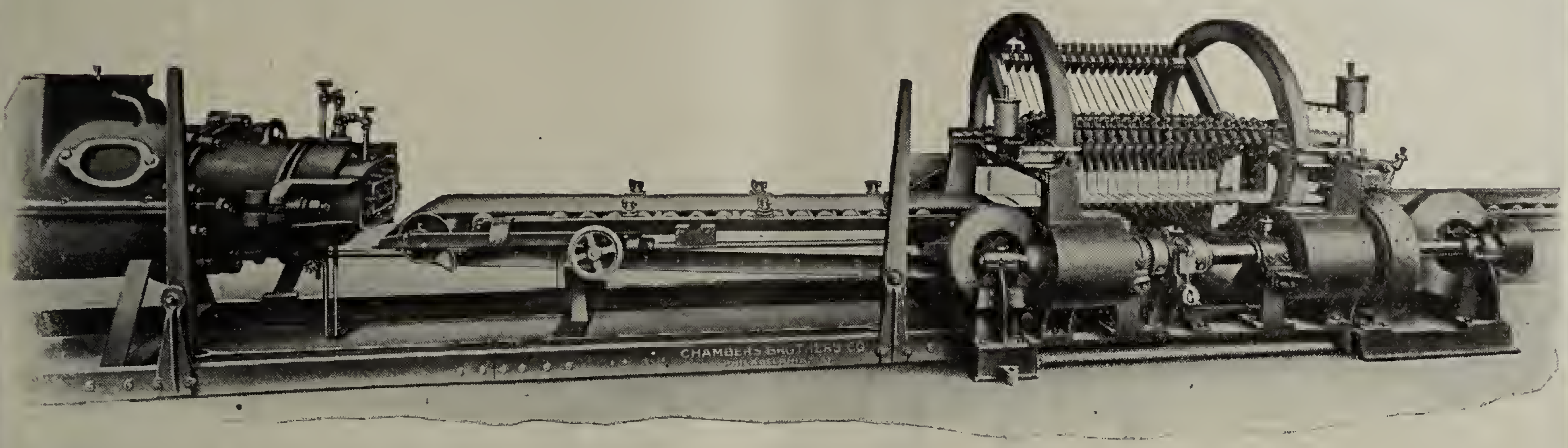
Through a Careful Consideration of the Criticisms of
Experienced Brick Manufacturers.



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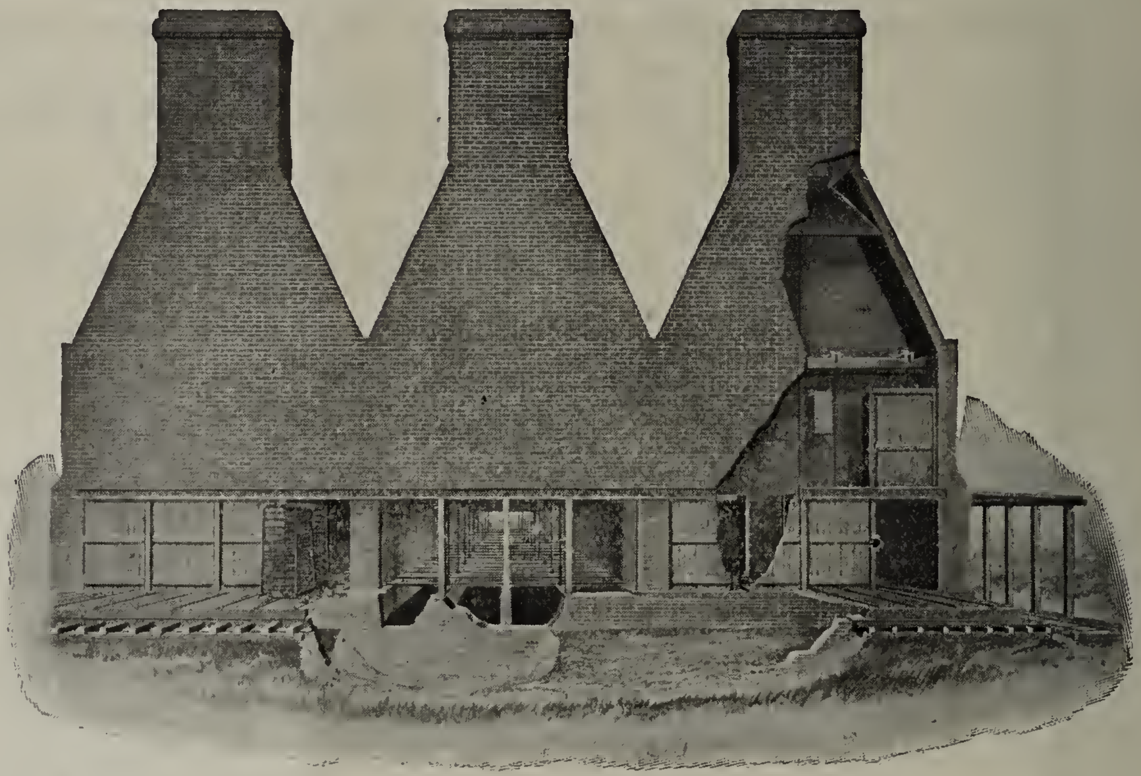

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THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXVI. INDIANAPOLIS, NOVEMBER, 1916. No. 5

Written for THE CLAY-WORKER.

SAFETY FIRST!

Boston Sets a Good Example by Requiring a Safe and Sane Building for the Billy Sunday Meetings.

"SAFETY FIRST" is a fine slogan, be it applied wherever it may, but particularly is it applicable to building operations, and especially so for public buildings where people gather in great numbers. The Board of Building Commissioners of Boston deserve high commendation for enforcing the local building ordinance and refusing to grant a building permit for a frame tabernacle which is to house many thousands of the devotees who will kneel at the shrine of the evangelist, Billy Sunday.

One of the Main Entrances to the Boston Tabernacle. Mr. W. H. H. Rogers, of Rochester, to the Left.

As a result, there has been built at the Hub, for the first time for Mr. Sunday, a substantial and to some extent a fireproof structure; a great tabernacle of a safe and sane character, the supporting walls being of hollow tile and the interior supports of steel up to a height of 7 to 12 feet, which makes it comparatively safe, much more so than the previous tabernacles erected for the purpose, which as a rule have been temporary frame structures. While no disaster has occurred in the past, that is a matter of good luck. It is surely the part of wisdom to guard against possible calamity, and the Board of Building Commissioners of Boston are to be commended for requiring this better type of building.

Now that it is erected, Mr. Sunday's representatives, who are exceptionally clever business men, appreciate the advantages of this type of tabernacle, and will no doubt in the future require similar buildings wherever they may go. Two tabernacles are planned for New York City, which will be Mr. Sunday's first stand next spring, if his present plans are carried out. His Boston services open November 12, and will run for ten or twelve weeks. He goes from there to Buffalo, and he will go from there to the metropolis, where he will probably hold services for a longer period than any other city heretofore visited.

The Boston tabernacle, the largest and best yet erected, covers an area of 250x300 feet, and affords a total seating capacity of over 15,000, 2,000 of which is devoted to the choir, press stands, etc. The magnitude of the services is indicated by the number of choir singers, which exceeds 2,000. There are two choirs serving alternate days. Fifteen hundred ushers are necessary to handle the great crowds that flock to the tabernacle. It is stated that $1,000,000 is necessary to finance this work in Boston. In addition to the main tabernacle, there are a number of other buildings necessary, such as an immense restaurant or lunch room, which will be in an entirely separate building and will accommodate 500 at a time. There will be other buildings, such as an emergency hospital, postoffice, book rooms, and special quarters for Mr. Sunday and his immediate associates, which will be equipped with bathrooms and other conveniences. All in all, it is a large business undertaking. The construction of the Boston tabernacle was begun August 12, and was to be completed Nov. 4. Services will begin Nov. 12 and will continue ten or twelve weeks

The action of the Boston building authorities is an object lesson that should be followed by similar authorities in every city in America. We as a nation are very lax in such matters. That is why the fire losses in this country are so much greater than in other countries. A brief review and comparison is timely in this connection. Every taxpayer in the land ought to take heed of our shortcomings and carelessness, which result in a per capita fire loss ten to twenty times greater than that of European cities. According to the latest available statistics, those of 1914, the per capita fire loss in the United States was $2.10. In England it was 67 cents; in France it was 63 cents, in Austria, 42 cents; in Italy, 37 cents; in Germany, 17 cents, and in the Netherlands, 7 cents.

According to the American Year Book, in forty-seven American cities the per capita fire loss during 1914 was over

$4. In thirty-four cities, over $5. In nineteen cities it was over $7. In fifteen cities it was over $10, and in ten cities it was between $12 and $33. This is the equivalent of a tax of that amount on each individual citizen. Compared with the fire loss in European cities, it is a disgraceful showing. In most cities in Europe a fire due to carelessness is a crime, for which the guilty party can be arrested and punished. That is one of the reasons why there are so few fires in European cities.

This personal liability is beginning to be appreciated to some extent in this country. Last year the city of Cleveland passed an ordinance which places on the individual on whose premises the fire originates the entire cost of extinguishing or attempting to extinguish a fire which can be traced to neglect of any order of the fire department or to any disobedience of municipal regulation. The Pennsylvania legislature passed a similar measure, applying to cities of the first class. Such laws ought to become the rule rather than the exception, and probably they will in time. There were 13,416 fires in New York City last year, 1,000 less than the year before. There will have to be 10,000 fewer fires there before New York ranks with London.

These are facts and figures which ought to be conspicuously posted in the office of every clayworker in the land, for better fire regulations and better building laws mean greater safety and economy for the taxpayers and a greater volume of business for the clayworkers. All honor to Boston for the good example set her sister cities in the instance of the Billy Sunday tabernacle.

Whenever the idea of better sanitation reaches the point of arousing action in a town or community it generally means the use of more sewer pipe. So the sewer pipe folks may well spend a fair shape of time investigating and promoting good sanitation doctrine.

FIRE PREVENTION DAY IN NEW YORK CITY.

"A PANORAMA OF ARGUMENTS AGAINST CARELESSNESS" is the apt way in which the Daily World referred to the big parade by which Fire Prevention Day was celebrated in the metropolis. It was the most pretentious procession of the sort yet attempted and its success was due in no small measure to Robert Adamson, fire commissioner, and the cordial co-operation of the entire fire department of that city. The purpose of the celebration was to bring home to the people of the city the importance of proper safeguards against fires and the cleaning up of menacing rubbish piles which accumulate over night, almost, in a densely populated district.

Not only was Fire Prevention Day celebrated by a great parade, but the day was observed by a series of fire drills in the city schools, and as well in many factories and other semi-public buildings. Members of the fire department had distributed throughout the city placards reading:

This is Fire Prevention Day.

Clean Up Rubbish.

Robert Adamson, Fire Commissioner.

These placards were displayed in the elevated and surface street cars and in elevators in the chief buildings and many other conspicuous places throughout the city, including the great department stores. Even the delivery wagons of the butchers, bakers, ice men and milk men were decorated with them, so that every citizen who had eyes with which to see was brought face to face with the slogan emblazoned on the placards.

There were many very interesting floats in the parade, which started at the municipal building and passed through the principal business sections and as well along some of the

View of the Interior of the Boston Tabernacle, Showing the Use of Steel Supporting Columns.

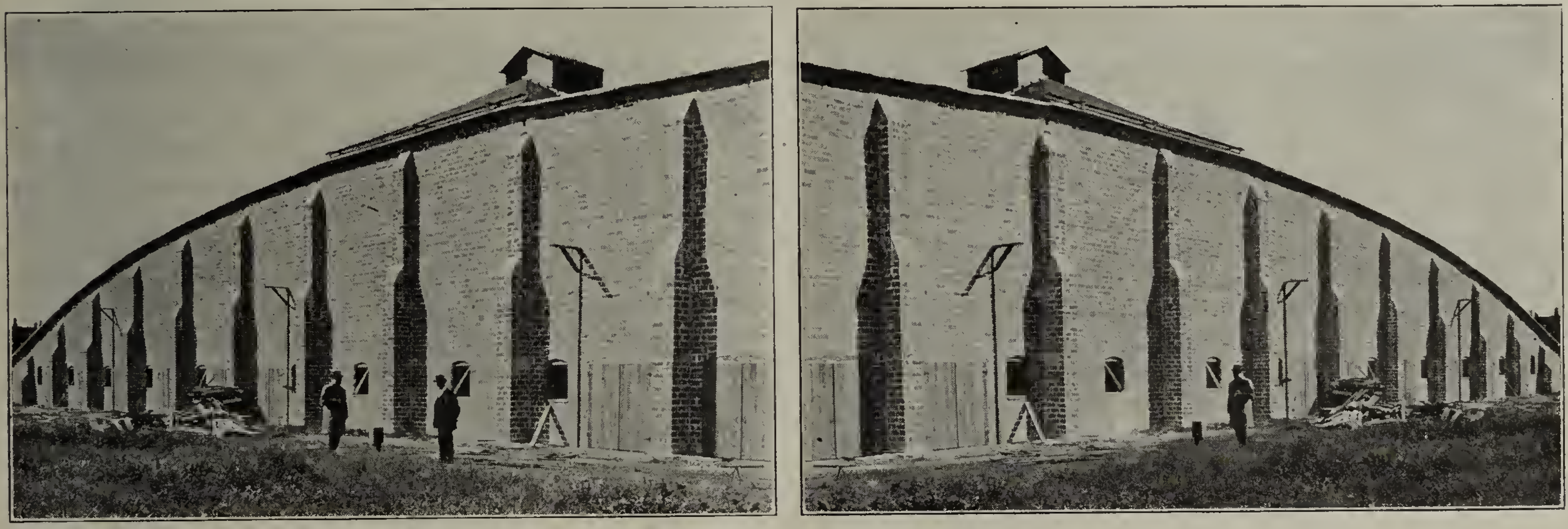
residential streets of the city. The procession was led by the fire department band, followed by some of the fire department apparatus, which is always an object of interest. The first float depicted a burning tenement block, illustrating how quickly flames are communicated because of improper construction.

Another showed children playing with matches, a light from one of which sets lace curtains afire. Parents are warned that the leaving of matches within reach of children is criminal.

One of the most interesting floats consisted of an immense lighted cigarette. On it appeared this placard: "Not less than 1,306 fires caused by this last year. The loss of property due to the carelessly thrown away butt was $96,261." The sign urges smokers to be more careful in the future.

An attempt to visualize the loss in money through fires was shown by an immense float on which stood a pyramid of "gold" bars seven feet in height. By way of comparison stood a fireman five feet ten inches tall. It is announced that the fire loss in that city last year approached the $6,000,000 mark. On a 6 per cent. basis this loss represents an investment of $100,000,000. Upon the conservative 4 per cent. basis it is $150,000,000.

"If we were to suggest," says Fire Commissioner Adamson, "that the city add $150,000,000 to the municipal debt, we would have a riot on our hands, yet each year the people of this city tolerate a waste by fire that is equivalent in interest lost to an addition of that much to the city's debt."



End View of the Boston Tabernacle. The Wall and Piers Are of Hollow Tile.

A series of three floats dealt clearly with the fire peril in factories. These caused considerable comment in the cloak and suit district, through which the parade passed. The first picture showed a factory inspector calling the attention of a factory owner to the heaps of rubbish on the floor. The second float portrayed a number of girls hanging from a fire escape and signaling in vain for help as a sea of flame yawned beneath them. The third warning consisted of an immense hand holding a lighted match, with the admonition, "Be Careful."

A bevy of young women from Washington Irving High School posed effectively on a float typifying civic progress. How fires are caused by throwing hot ashes in wooden boxes near cellar furnaces and by storing naphtha, benzine and gasoline near fire, was also explained. Benzine vapor will ignite 200 feet from its base.

New York is distinctively a brick city, and if the need for fire prevention is so seriously felt there, the situation is much more serious in lesser cities where frame buildings are still tolerated. In the latter we would suggest that the brickmaker get in the game and display conspicuously our own slogan, "BUILD WITH BRICK," for therein alone lies a great measure of safety.

OCCUPATIONS FOR WOUNDED CLAYWORKERS.

A REMARKABLE STATEMENT has been made in a recent number of the German Clay Industries Journal, to the effect that no works are so well adapted to the employment of maimed workmen as are the brick and tile works and in a lesser degree the potteries, from this it is argued that the wounded German soldiers should be specially drafted to these works at the end of the war.

Whilst it may be admitted that in many details of the manufacture of brick and tile, it is possible to employ men with an artificial leg, the number of men with artificial arms who could be utilized in making brick and tile must be very small indeed. It is true that a one-armed man can look after a mixer fairly well, and that he may exercise a general oversight as a foreman, but the number of such men who can be employed in one works is usually regarded as limited to about two for every five million brick produced per annum. This is not the case, for many more maimed men can be employed.

In picking fireclay, a man with one normal arm and one artificial one may be able to work efficiently, though probably he would find it very difficult to continue for the usual working hours. Such a man might assist with the fastening of wagons to a ropeway, and he might work the hoist or control various levers and cage-operating gears, though this would always be with considerable risk to himself. Some men with artificial arms are able to dig a mild clay, but they are not efficient at the work, and it is rather cruel to employ them for digging of any kind. They do better at packing brick, though with one arm they work less than half the rate of an equally good worker who has not been wounded.

If a soldier has been a skilled burner before joining the army, he may continue his occupation, notwithstanding the loss of one arm, provided he has someone to wheel the coal and that he works on a continuous kiln. For ordinary single kilns, the work of stoking would be too heavy, but on a continuous kiln so small a shovel is used that only one arm is needed. Intelligent men who have a good eye for color, might easily learn to burn a continuous kiln, and so get a good wage in spite of being maimed. There are a few burners with only one eye, but they ought not to be allowed to continue wholly as burners, as the strain on the remaining eye is too great.

In office work, it is often possible for a man with an artificial arm to work as well as one who has both his arms, though appearances are somewhat against the former.

In short, there are many opportunities for the employment of wounded soldiers in clayworks, if they have had a training fitting for this work, and so long as the nature of their wounds permits. It would scarcely do for one-armed men to wheel brick, for the risk of injury if the barrow overturned would be very serious.—The Canadian Clay-Worker.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART VI.

COOLING AND FLASHING.

COOLING IS NOT a stage in the burning but in many wares proper cooling in order to anneal the ware is an important factor in the production of sound tough ware. When the firing ceases, particularly in vitrified wares, the mass is in a state of semi-fusion, and the rate of cooling has material effect on the physical structure. Minerals are forming and crystals developing which serve to lace the mass together and give it greater resistance to shocks. In some measure we may compare the fused mass with glass which as is well known must be annealed to relieve the strains and give it the toughness without which it would be of little practical value. We have held that the annealing is accomplished at a low red heat and that we may safely cool rapidly from the finishing temperature down to a red heat when the rate of cooling should be slower in order to properly anneal the ware. Kiln burners are familiar with the snapping and cracking that can be heard in the kiln as the cooling takes place and these evidences of the relief of cooling strains are only heard in the later stages of the cooling process.

Wares that are subject to cooling cracks are particularly benefited by thorough annealing, and such wares should be entirely cooled by conduction and radiation and not by convection. The kilns should be closed and daubed and the dampers closed during the annealing stage. Cooling cracks are easily recognized. They never open up and a casual observation does not reveal them. Ringing two bricks together will show whether the ware is cracked or not, and if cracked an examination will reveal a fine hair-like crack, sometimes nearly through the ware. In fact, the ware may be entirely cracked through and when picked up falls into two pieces, yet the crack is not seen until some movement has caused a separation of the two pieces. The top courses in many paving brick products are rejected because they are too brittle, although they are the hardest bricks in the kiln, and except for the brittleness should stand the best test. We frequently find cooling cracks in such bricks, but they are difficult to see, as the bricks come from the kiln. After exposure to the weather, when the cracks have been developed by the infiltration of dirty water, they are very evident.

Some wares, including vitrified products, are apparently not improved by slow cooling, and the cooling fans can be connected, or the wickets opened and the dampers raised as soon as the burning is finished and the cooling from beginning to end carried out as rapidly as possible. Theoretically any ware will be improved by slow cooling, but in view of the practical evidence it would be foolish to urge slow cooling on a theoretical consideration. Every manufacturer, however, should determine whether his ware is improved by slow cooling and to what extent. It may be cheaper to stand the cooling losses than the cost of the slower operation, and, of course, which shows the most profitable operation should be adopted.

Flashing.

Flashing might properly be included as a burning period, since in many instances it is the final operation in the burning. The purpose of flashing is to produce a color effect different from that which naturally results from ordinary burning. A flashed color on red burning wares is brown to gun metal black; on buff burning clays a golden yellow to brown.

Flashing is accomplished by closing the fires toward the finish of the burn, thus shutting out the secondary air, resulting in a strongly reducing kiln atmosphere.

The common method is to begin flashing twelve to twenty-four hours before the finish of the burning. The fires are closed for a period of two to six hours, followed by a longer or equal period of clear fires, and the alternations are repeated until the end of the burn. In some operations the reducing conditions are started earlier in the burning and it is found that a sufficient depth of flash can be obtained in this way without carrying the temperatures to such a high degree, but the results in this method of firing are less brilliant and in consequence do not find the same favor on the market.

Flashing in all its variations is not fully understood. The reducing action of the kiln gases will keep the iron minerals in the ferrous oxide state or convert them into ferrous oxide and, as has been shown, the iron in this state readily enters into silicate combination, producing a brown to black ferrous silicate. This will explain the brown to gun metal black colors from red burning clays, but does not explain the golden yellow colors which develop on the face of buff burning clays.

The iron content in many buff burning clays is largely segregated in grains and the ordinary reducing effect is evident in the development of black spots throughout the body of the ware, but the golden yellow color is a surface effect and does not penetrate the ware. Moreover, only the faces that have been exposed to the flame or to the moving combustion gases have the "fire flashed" color. Even in the red burning wares the color on the faces exposed to the flame is more brilliant than those not so exposed. This greater brilliancy may be due to a greater degree of fusion, but we believe that the contact of the combustion gases with the surface has had effect just as in the buff burning ware.

It is said that flashed colors are due to some chemical change in the iron content in the clay, likely ferrous silicate, which would occur under reducing conditions, and that in the cooling there is a superficial oxidation of the iron which would give the golden color.

It has been our opinion that the surface flash is in some degree due to a surface accumulation from the combustion gases.

We have seen masses of iron or iron slag a half inch thick built up on the surface of bricks which have been exposed to a flame jet through a crack in the bag wall, and crusts on the crowns of high temperature kilns are familiar to many clay workers.

The faces of heavily flashed bricks have a roughness sensible to touch which is not apparent on the backs. Where the flame passes through a small aperture, as the checker in closely set brick ware, the flash on the under brick is fan shaped, just as the gas would naturally flare out after leaving such an aperture and the flash is the mark of the moving gas.

Flashing is evidently a flame phenomenon, and is presumably due to iron. At least we may say that a clay which does not flash readily will flash if magnetic iron ore is added to it. Clays containing manganese also flash in greater degree than the buff burning clay to which the manganese is added, but as the manganese is impure and contains iron, the flashing may be due to the iron content rather than to the manganese. Whether the flash is due to a chemical change in the iron content in the clay, to a volatilization of the grains of iron in the clay or to a surface accumulation from the gases is not important except the determination of the question might lead to more intelligent development of flashed effects.

The flashing is more intense the nearer the ware is to the fire, but this gives no light on the problem because temperature and reduction are factors in producing the flash, and these prevail in higher degree near the fire.

If the flashed ware is cooled very quickly, the flashed color does not appear, and the flash is more pronounced as the cooling is slower, within reasonable limits. This is merely a question of oxidation.

All kiln burners are familiar with the difference in color of the draw tests and the properly cooled ware. The browns cool to reds, the blue, gray or green to buff. This difference in color is more marked in flashed ware, perhaps, because of a finer state of division of the mineral which produces the flash and a greater susceptibility to oxidation of the fine material.

It is also known that the flash on a fire clay product can be burned off, in part at least, by reburning the ware under oxidizing conditions.

The process of manufacture has considerable effect on the flashed color and only rarely can the same color be produced on the same clay ware made up by different processes. Many dry-pressed bricks have a beautiful golden flash, while the stiff-mud bricks from the same clay lack the golden color and often are dull brown. There are, however, good flashed stiff-mud bricks, and the difference is only one of degree in the effect on the same clay made by different processes. The dry-pressed flashed bricks have retained a strong hold in the market partly because of the fine color and partly because they are more impervious than other dry-pressed bricks, but the use of the plain red, buff and gray dry-pressed bricks has been waning.

(To be continued.)

Written for THE CLAY-WORKER.

NEW YORK AND VICINITY.

BRICK ARE very firm, with $7.75 to $8.50 quoted by different holders. The supply coming forward is small, and some of the New York storage places are virtually bare of stock. Only a few barges are coming in now. In the up-river sections the number of brick turned out is light. Only a few yards are in operation, and they are probably not operating to capacity. It is near the close of the season. But the weather was good all through October and has been thus far in November, with the result that yards have been able to operate nearly a month later than usual.

But even that hasn't helped much for the reason that labor shortage has restricted output, and the last month has really been little more than cleaning up. The price in New York is trending upward, because of the assumed scarcity, and most sellers are insisting upon full outside figures, with the exception of permitting large buyers a small reduction. If the building operations contemplated are continued, a shortage of brick in all positions is almost a certainty in New York. The bulk of the demand is over for this fall, perhaps, but it has left the storage yards well cleaned up and relatively few are left at the river yards. The result may be much higher prices for those who want brick to finish work this fall.

A considerable number of important building plans were filed before the ordinance limiting the height of structures went into effect, but it is understood that some of these may not be erected for some time yet. Maybe a few never will be erected. But the projectors wanted to retain the right to build as high as they chose and filed the plans. Now they can do as they please about building. This may show some discrepancy between the plans filed and the work actually done. Some are of the opinion that New York is overbuilt in business structures now and that the growth of business should be allowed to catch up before much more money is invested in that type of operation. Lofty buildings have been the general type erected during the past few years, and some of those show large vacant spaces. This is tending to make investors conservative, since they hardly care to put up much more money until they see some indication of return. Business building has developed very fast during the years that lofts have been the type erected, and manufacturing has hardly caught up with the available space.

One of the latest possibilities is that the cloak and suit trade may move bodily to Long Island City, where new factories and a large number of dwellings are to be erected for the thousands of employes who would probably go with the development. Plans are drawn and options have been secured on the land. Nothing certain is known about the proposition, excepting that it would be one of the largest in the history of New York, if carried out on the basis now under consideration.

A. L. B.

TOO MUCH PEN PUSHING.

About the most discouraging thing in the Latin-American trade situation is in the mass of stuff being written about it by self-elected advisors, who do more fault-finding and confusing than anything else. We may be wrong, but somehow we have more faith in the good sense of our business men seeking to trade down there than in the pen-pushers who keep telling us all about it.

Written for The Clay-Worker.

ENGLISH BRICKMAKING.

BY J. W. OVEREND.

BRICKMAKING in England dates a long way back, for the industry was first introduced into England by the Romans who used large thin bricks or small tiles as bond to their stone rubble wall construction. In the reign of Henry the VIII, 1529, brickmaking had arrived at a great perfection and there remains some very old historic castles and halls which were erected of brick during that period.

Panelled friezes, cornices and other ornamental work were constructed of terra cotta moulded to the required form and shape, in fact, the terra cotta for decorative panels and bas-reliefs appears to have been very common during the years 1529-1590.

On the rebuilding of London after the great fire of 1666, brick was the material universally adopted for erecting the new houses, etc. One of the resolutions of the corporation of the city of London, passed about that time, is as follows: And that they (the surveyors) do encourage and give directions to all builders, for ornament sake, that the ornaments and projections of the front buildings be of rubbed bricks; and that all the naked parts of the walls may be done of rough bricks, neatly wrought, or all rubbed, at the direction of the builder, or that the builders may otherwise enrich their fronts as they please.

Much of this old brickwork still remains in London in buildings erected between the years 1700 and 1800, and a very remarkable feature is that the brickwork of this period was the introduction of ornaments carved with the chisel.

The processes employed in the manufacture of bricks differ very largely in the various parts of that country. In some districts the clay is ground between rollers, and the pugmill is never used. In others, both rollers and pugmills are employed, whilst in some cases the rollers are unknown, and the clay is passed through a wash mill. The forms of the kilns varies greatly. As a matter of fact brickmaking differs in each particular county or state, according to the custom handed down, for a great many of these brickworks have long histories attached to them.

The operations involved in English brickmaking can be classed as follows: Preparation of the clay, tempering, moulding, drying, burning. In some brickyards the bricks are made with the best modern machinery possible, whilst in others the methods adopted are very primitive.

The usual size of a North of England brick is 9x4½x3-in. Though after burning and drying, etc., the measurements are 8⅞x4⅜x2⅞-in., or equal to ⅛-in. each way in regard to shrinkage. In other parts of England the size of bricks run smaller.

Casting and Molding Drain Pipes and Chimney Tops.

Molding, Planing and Trimming Edges of Fire Brick.

Besides ordinary brickworks there are those who make fire bricks and earthenware goods of all descriptions for sanitary purposes. These fire bricks are as yet made by hand in many districts in brass-lined boxes, for the reason that many users prefer hand-made fire bricks because those made in presses are so tightly compressed as to be insufficiently porous enough for the purposes for which they are adapted.

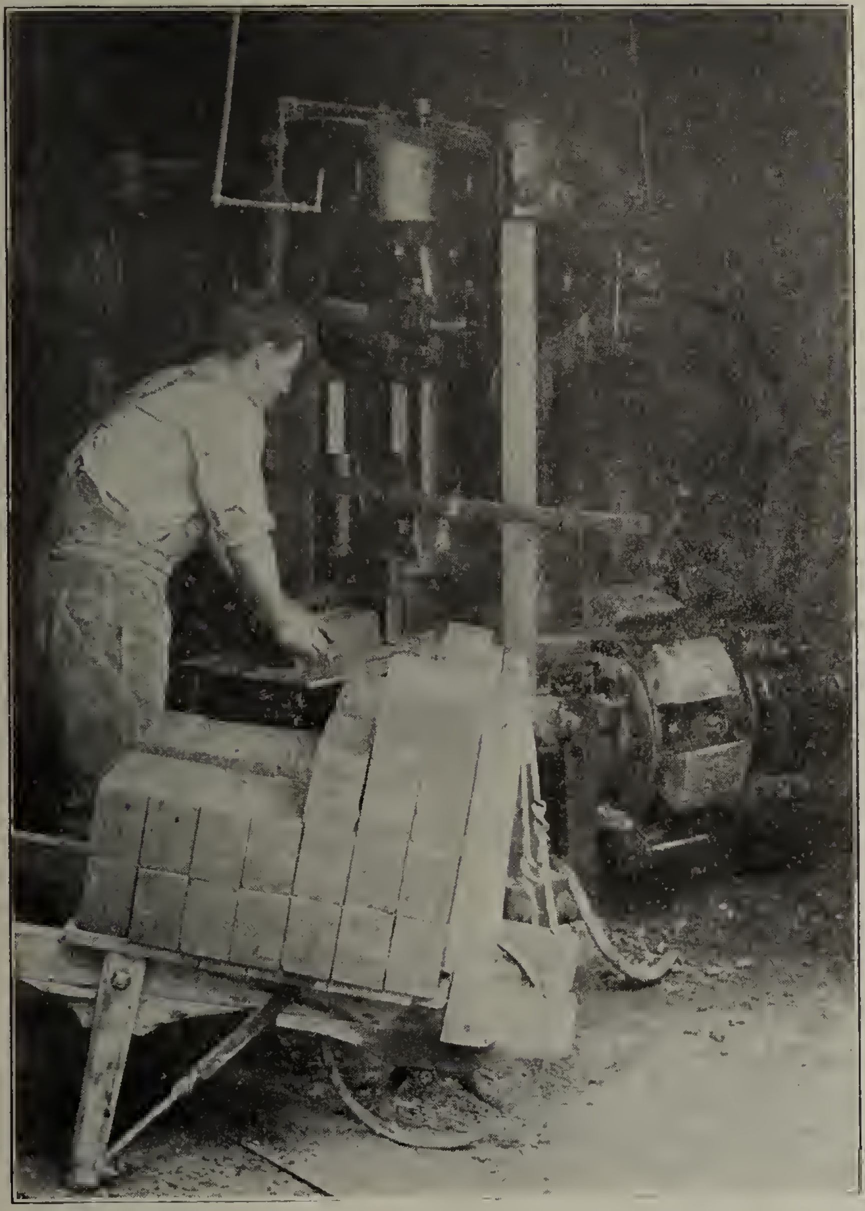
After the clay is gotten from the ground and conveyed to the mixer by means of a continuous truck chain arrangement, the moulder moulds the bricks in the boxes referred to and then passes them on to the planer, who with a plain piece of wood finishes the brick ready to be carried away by the carrier to dry and then afterwards burned.

At most of these brick works sanitary goods, etc., are made and the pieces cast in half and then joined together and clamped to form the whole profile, the goods being afterwards burnt at the kiln.

Common bricks are made at many brickworks by the stiff plastic process, a Fawcett presser being utilized, while for the burning the elliptical shaped kiln, known as the Hoffman, is used. Though in many English counties there is an abundance of stone, yet brick has held its place in English building construction, and its uses are becoming greater each year, for it has been clearly shown that a well burnt brick has sufficient weathering properties in it to resist for a very long period the ravages of Father Time.

HEARD IN NEW ENGLAND.

NEW ENGLAND brickmakers, as well as all the manufacturers of the East, have suffered for want of labor all the season, and nearly all yards have been forced to deliver a reduced output. Those who were able to make as much as they received orders for were admirably situated, since the demand far exceeded the supply. Because of this some have seen their profit increase, while others have suffered somewhat because of the impossibility of turning out the stock wanted.



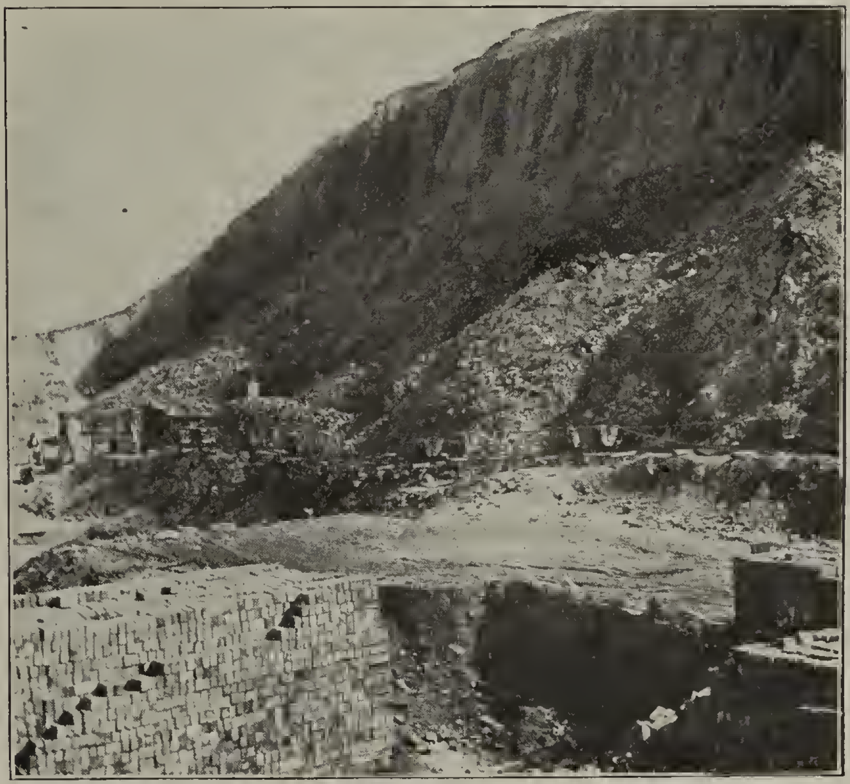
Making Dry Press Brick on an English Brickyard.

The yards are all closed now, and operations have ceased all through the six states. Cement has apparently maintained its hold here. A good many of the new factories erected during the year—and it is the largest year for a considerable time—have been of reinforced concrete and cement. Not many have been of brick, speaking in a comparative sense. Perhaps this was due partly to the fact that brick were hard to obtain and no manufacturers were in position to fill orders as wanted. Here and there it might be that this statement is not absolutely true, but the fact remains that the labor shortage has been too serious for the comfort or profit of makers. As long as the munition plants are in operation in some sections and as long as immigration is restricted everywhere, the present conditions will unquestionably prevail, And that, of course, means high prices for brick. But lumber is advancing as well, so that the proportion is about maintained. New England brick men have enjoyed reasonable prosperity all the season. They might have done better if they could have made up the stock.

HIRAM.

SAVE THE WASTE PAPER.

Perhaps every man in the country has during the present year been moved to an order of thrift in regard to paper that has not been dreamed of before in the present decade. At the same time, those who buy paper in quantities have been confronted with startling increases in price that in many instances have worked a hardship, for the time being at least. Even those who purchase only limited quantities in the form of stationery have been made cognizant of the increase in paper value. On account of this we have perhaps developed something like a proper regard for paper and something near the right order of thrift in connection with its use. This is really the important phase of the present flurry in the paper situation. Paper has been considered such a cheap item in this country that we have handled it with carelessness and recklessness that really needed some kind of a check. Even to-day, with prices doubled, paper is a comparatively cheap item—that is, compared to many other products, and not with previous prices here. Moreover, economy in paper and the saving of waste have long been matters of regular routine in the older countries, and we perhaps needed a little shaking up in this country to impress us with the need for thrift and to get paper into our minds right as having some value and as needing more thoughtful consideration in its use and less careless extravagance in its waste. We use more paper in this country than is used anywhere else in the world, and more of it in practically every branch which it enters, from publishing newspapers and trade papers to the making of paper boxes, and incidentally we have been destroying and wasting more of it than perhaps all other countries in the world combined. Consequently it may be good for us eventually to get a little shaking up now that will bring a degree of appreciation, of thrift and economy in such small things as waste paper.



Endless Chain Conveyor Used to Take Clay Cars to Plant.

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time, dealing with practical and technical matters of especial interest to the ceramist. This month we give a paper published by the Bureau of Standards.

PROPERTIES OF SOME EUROPEAN PLASTIC FIRE CLAYS.

By A. V. Bleininger and H. G. Schurecht.

IN THE MANUFACTURE of glass pots, tank blocks, glass furnace accessories, graphite crucibles, and similar refractories a certain amount of plastic clay is required for the purpose of bonding together the grains of calcined material, ground potsherds, and previously burned fire clay, which constitute from 50 to 60 per cent. of the mixture used.

The requirements of such clays are very exacting and may be summarized as follows:

First, they must possess sufficient refractoriness to withstand the high heat of the furnaces, under the pressure of the liquid charge, without showing deformation; second, great plasticity and bonding power, making possible the cementing together of the grains of calcined material to a satisfactory compact mass; third, considerable mechanical strength and toughness, especially in the dried state; fourth, the quality of becoming dense at comparatively low temperatures in order to produce a structure impervious to the liquid glass or metal and resisting their corroding influence; fifth, the property of retaining a sound structure, free from vesicular development upon long-continued heating; sixth, the quality of resisting sudden temperature changes without checking or spalling; seventh, the property of drying and firing safely without cracking.

These requirements are severe and are possessed by comparatively few clays. The materials which have been found most satisfactory by years of practical experience are a number of European clays, principally those from Gross Almerode. Klingenberg, Schippach and the Westerwald district in Germany, from Belforce and the Ardennes region in Belgium, and from the Stourbridge district in England. These clays possess the properties demanded of glass factories to a marked degree. It would seem desirable, therefore, to investigate their properties in order that a basis of comparison be established, enabling us to estimate the value of domestic clays for the same purpose. Such results should be of particular importance at the present time when shipments of European clays are uncertain with the prospects of ceasing entirely.

II. Nature of Plastic Fire Clays.

1. Structure.

We must at once eliminate from the discussion all kaolins and kaolinitic clays, which though refractory are lacking in plasticity and bonding power. This applies even to the secondary or plastic kaolins which occur interstratified with fresh-water limestones, sands, etc., in Georgia and the sandy deposits in Florida. All such clays possess a chalky, more or less friable, structure, and though they may be quite plastic they are lacking in bonding power and in strength when dried sufficient for the present purpose.

The clays under consideration may exist in the soft or the indurated state. In the latter case they require grinding before they are able to assume the plastic state when admixed with water. Good examples of plastic refractory clays in the soft state are the so-called ball clays of Tennessee and Kentucky in the United States and those from Devonshire and Dorset in England. The clays of this type are frequently high in carbonaceous matter and hence appear dark colored. Their plasticity is very great, their requirement of water of plasticity high, and their drying shrinkage marked. In the semidried condition they are tough, have a greasy feel, and when cut are found to possess a horn-like surface. They are apt to crack on drying when molded into larger masses, without the addition of nonplastic material. In the dried state they possess considerable mechanical strength.

The indurated or hard fire clays are usually of massive structure, show a characteristic conchoidal fracture, and slake down to a plastic mass when weathered. They often show silkenside surfaces. Grinding of the unweathered material must be invariably resorted to before it can be worked into a plastic mass with water. Considerable differences exist as to the readiness of slaking. Carbonaceous matter is invariably present in such clays and seems to be intimately connected with their nature. In certain cases the fatty character of the clays may be directly due to this constituent. Addition of caustic soda seems to saponify the organic constituents, forming salts of the fatty acids. In many clays the organic matter may be present as hydrocarbons. It is noted also in connection with clay deposits occurring beneath lignite beds that the part closest to the coal and highest in carbon possesses the greatest degree of plasticity. It is not unlikely that the organic matter may be closely associated with the difference between these clays and the kaolinitic materials. A dense, quite impermeable structure is characteristic of these clays. Their specific gravity, determined upon dried lumps, in the natural state, is considerably higher than that of the "fatty" alluvial and surface clays and affords a valuable distinction. Their compactness, therefore, is an essential condition.

The presence of iron pyrites is common with many of these clays. The occurrence of this mineral in appreciable quantity destroys their value for the purposes under discussion.

2. Plasticity and Bonding Power.

Plasticity is the property of clays assumed by them when mixed with water and represents that condition in which they may be molded without suffering subsequent deformation. It is a condition made possible by the dispersed state of the hydrous aluminum silicates, known under the general name of clay substance. A certain portion of most clays is in such a finely divided state that the particles assume the properties of a suspensoid colloidal system. These fine particles have been estimated to possess a mean diameter of from 0.005 to 0.003 mm. According to the amount of the dispersed matter, the degree of dispersion, the nature of the fire particles and their compactness, the varying degrees of plasticity are produced, ganic colloids and electrolytes appear likewise to influence this property to a very considerable extent.

The above statement that the cause of plasticity is to be sought in the dispersed state of the mineral particles is now generally accepted as being the most satisfying one. It must be considered a state rather than a particular kind of matter, though it must be realized that the latter point is of considerable importance. Thus, barium sulphate, usually crystalline, may under certain conditions form a colloidal, plastic substance. It is not to be supposed, however, that it would show the same degree of plasticity shown by the complex aluminum silicate, known as clay substance, which by virtue of its complex constitution, its content of OH groups, and slight solubility in water would be more inclined to be stable in the non-crystalline state. No entirely satisfactory measure of plasticity has yet been devised and some of the tests are of an indirect character. The Zschokke[1] method of determining the tensile strength and deformation of the clay in the plastic state, that of Grout[2] and of Emley,[3] involving the measurement of deformation under compression, seem to be the most promising. The latter two methods correlate the pressure required to produce fracture of the test cylinders and the deformation. One of the important difficulties is the consideration of the proper water content; that is, normal consistency. Fortunately, an experienced operator is able to detect the best working consistency with a considerable degree of accuracy. Mechanical tests, such as the application of the Vicat needle, have not been more satisfactory than the estimation by the "feel."

It is generally known among clayworkers that the very plastic clays require more water in order to assume the best working consistency than the leaner ones, in agreement with the fact that the former represent a greater degree of dispersion and hence more surface to be coated with film of water. Excessively plastic clays may thus be clearly distinguished from those of normal properties by their high water content. The shrinkage of clays upon drying parallels the content of water of plasticity, for the greater the latter the more contraction is bound to take place. Hence, both the content of water and the drying shrinkage are indirect means of estimating the plasticity.

Atterberg[4] makes use of this factor by determining the amount of water contained by the clay in two stages, at the "rolling" and at the flow limit. The first is that stage at which the clay can just be rolled into threads, a point quite sharply defined; the second represents the state in which the clay can be made to flow on a concave smooth surface which is subjected to rapid impacts. The difference in the contents of water represents the so-called Atterberg plasticity factor. The greater this value the more plastic is the clay supposed to be. Applied to American clays, Kinnison[5] has found it necessary to correlate the Atterberg number with the total content of water of the clays when they are in the plastic state. The results of this worker are compiled in Table 1, which gives the limiting values for the different classes of clays.

Table 1.

Material	Atterberg plasticity factor	Minimum water of plasticity Per cent.	Maximum water of plasticity Per cent.
Kaolins:			
Primary	6.5-10	27	31
Secondary	13 -16	25	31
Ball clays	16 -29	29	35+
Plastic fire clays	8 -10	15	19
Shales	7 -12	17	22

According to the Atterberg factor the wider the range in water content between the two limits the more plastic should be the clay. In general, this agrees with practical results. Thus, sandy clays possess but a narrow range and the excessively plastic clays a very wide one. In this connection it might be stated that excessive plasticity may be as detrimental as low plasticity, inasmuch as the water-laden structure of such materials does not result in the desired strength besides giving rise to difficulties in drying and burning.

Of the indirect methods that of determining the tensile strength of the clay in the dried state seems to be used most commonly, though it is being replaced more and more by the transverse test of dried bars. In general, it is undoubtedly true that the mechanical strength of the dried clay is, in a way, a measure of the plasticity, since this is known to be the case for the strong ball and bond clays. There are experimental difficulties to be met, however, due to the cracking and checking of the clays in drying and to strains set up which give erroneous results in the strength tests. Cracking may occur even in the most carefully conducted drying process. For this reason it has been suggested that the clays be intimately mixed with 50 per cent. by weight of standard Ottawa sand and these errors avoided.[6] In this manner the results would be indicative also of the bonding power of the material, viz, its capacity to cement together a given volume of nonplastic particles and to produce a body of the required mechanical strength. The error incidental to strength tests of dried clay is quite large and it has been the practice in the Pittsburgh laboratory of the Bureau of Standards to take as the reported result the average of 20 determinations. In Table 2 the results of a large series of tests are compiled giving the tensile, compressive and transverse strengths of dried clays, without and with the admixture of standard Ottawa sand in the proportion of 1:1, by weight.

Table 2.

(Data shown in pounds per square inch.)

Material	Tensile strength		Compression strength		Modulus of rupture	
	Without sand	With sand	Without sand	With sand	Without sand	With sand
English ball clay (a)	210.0	190.0	1148.0	777.0	558.0	330.0
English ball clay (b)	161.0	152.0	806.0	623.0	438.0	303.0
Pennsylv. No. 2 fire clay	155.0	113.0	631.0	476.0	520.0	216.0
English ball clay (c)	154.0	158.0	1056.0	556.0	508.0	319.2
Georgia kaolin (a)	147.0	110.5	455.0	390.0	325.0	210.0
English ball clay (d)	135.0	127.5	565.0	464.0	375.0	242.0
Tennessee ball clay	125.0	124.0	633.0	489.0	380.0	243.0
Georgia kaolin (b)	109.0	97.5	519.0	559.0	269.0	182.0
Florida kaolin	104.0	54.0	539.0	286.0	239.0	122.0
North Carolina kaolin	56.5	34.9	349.0	168.0	166.0	82.0
English china clay (a)	33.2	26.1	228.0	172.0	98.0	53.0
English china clay (b)	29.6	28.8	205.0	164.0	74.0	56.0
Ohio No. 3 fire clay		150.4	954.0	553.0	484.0	280.0
Ohio shale	136.0	101.0	636.0	403.0	311.0	199.0
West Virginia shale	187.0	77.0	748.0	407.0	403.0	178.0

Another indirect test for plasticity is also the so-called slaking test, in which a cube of dried clay is immersed in water and the time of its disintegration noted. Clays of the kaolin type will slake almost instantly, and as the character of the materials becomes more and more of the strong tenacious type the time required to break down the specimen will increase in a very decided manner. Very strong clays resist the slacking action of the water for a considerable period. This test is practiced by German glass pot makers and may be modified by intimately blending with the clay, in the dried state, potters flint in the proportion of 1:1 by weight and molding into seven-eighths-inch cubes. After drying at 110 degrees C the cubes are immersed in water at room temperature and the time of their breaking down noted.

3. Fineness.

The fineness of grain of clays is closely associated with plasticity, as has been mentioned before. Of greatest interest in this connection is a knowledge of the quantity of finely dispersed matter which contains practically all the clay substance and in addition some of the nonplastic constituents, quartz and feldspar. The apparatus used for this purpose is either of the elutriating or the sedimentation type, employing water as a medium. In the first kind of separating apparatus several arbitrarily classified groups of sizes of grain are removed by means of definite velocities of the water current. The first group separated comprises the particles of the smallest size which can be removed under conditions possible of control. Seger[7] has adopted for this group a velocity of 0.18 mm per second, which corresponds to a maximum size of

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[1] Bull. Soc. d'encour., p. 103, pp. 619-658, 1902; Baumaterialienkunde, 7, pp. 149-152, 165-170, 1902.

[2] Geol. Survey of W. Virginia, III, p. 40.

[3] Trans. Am. Ceram. Soc., 17, p. 612.

[4] International Reports on Pedology, 1911; C. S. Kinnison, Bureau of Standards, Tech. Paper No. 46.

[5] Loc. cit.

[6] Bleininger and Howat, Trans. Am. Ceram. Soc., 16, p. 273.

[7] Gesammelte Schriften, p. 33.

(Continued on page 472.)

THE CONSTRUCTION OF TILE ROOFS.

By Richard B. Hoehne.

IT CERTAINLY IS a timely and well appreciated desire of The Clay-Worker to facilitate the publication of details pertaining to the construction of tile roofs. From time to time questions are noticeable in these columns asking such information. This proves that the broad public is beginning to take some interest in utilizing the only time, weather and fire-proof material to provide an ample protection to their homes and to themselves.

Although in general a state of infancy is still prevailing with the roofing tile industry of America, I am pleased to state that at least one city in this great country may surely claim an exception. In my conviction there are but few cities in the entire world that could possibly demonstrate greater efforts to beautify their houses, churches, etc., and to fireproof their roofs by using burned clay tile, than this has taken place during the last few years in the city of St. Louis, Mo. Here you can see public buildings, churches, residences, barns, garages and structures of every other description roofed with tile. From a most beautiful dark green glaze to a common red ranges the variety in colors, while the different shapes of the tile represent a magnitude of variation.

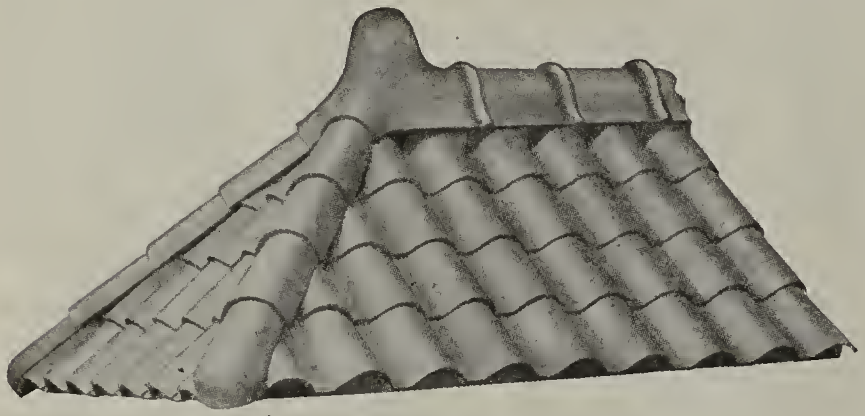


Figure 1.

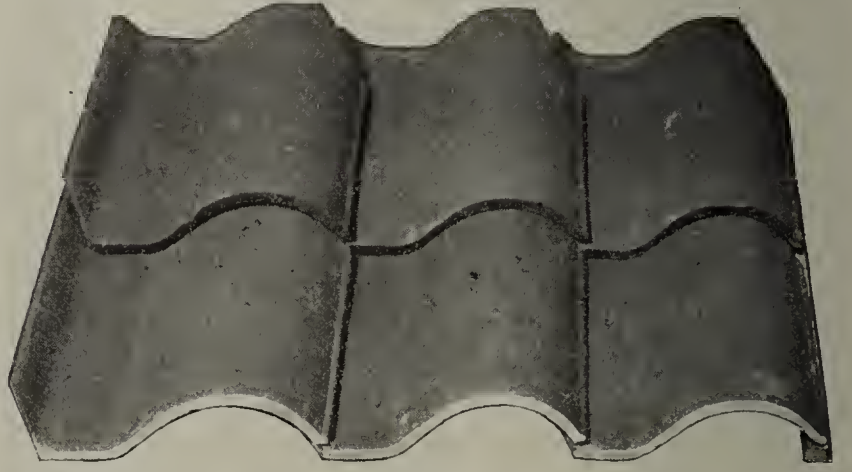


Figure 2.

But why is it that St. Louis is forging ahead of other cities in the adoption of tile roofing? Is it not especially remarkable, as the St. Louisians are all from Missouri and "got to be shown"? This, however, may be just the logical consequence, because they have been shown. Right here in St. Louis is a roofing tile factory second to none on this continent, which for the past six years or so has spared no efforts to boost the local roof tile business. Furthermore, right in St. Louis is located the establishment producing the foremost machinery adapted to the manufacture of all styles of roofing tile, thus indirectly facilitating the growth of this branch of clayworking.

One of the most popular patterns of roofing tile used in the city of St. Louis is the Spanish tile, which from an architectural point of view implies highly desirable qualities, as can be readily verified from the accompanying cut, Fig. 1. In the construction of a roof upon which Spanish tile are to be used, a pitch of not less than 30 degrees should be observed for the average size roof, while with increasing length of the rafters the pitch should also increase; with extremely short rafters the pitch may be slightly less than 30 degrees and still furnish sufficient slope for the water to run off quickly. In explaining the reason for this requirement, I will just mention that naturally—in case of a rain to which a roof is exposed occasionally—a roof of considerable width —thus, having long rafters in it—will catch and accumulate more water than a narrow roof. Hence, to remove the water from a very wide roof just as quick it must have a greater incline.

The methods generally practiced in laying Spanish tile prescribe the application of an under-roof, this being the only adverse in the economical use of this style of roofing. Similarly to the preparatory arrangement made for slate or tar paper roofing, common sheathing is applied throughout the roof and then covered with rubber roofing or tar paper. On top of this—in distances to suit the length of the tile—thin wooden strips are nailed down, to which the tile are fastened with small nails. The cut shown in Fig. 2 indicates how the tile lap over one another. Sideways no play is permissible in the lap; the over-lapping tile should be joined tightly upon the border of its neighbor. The lap appearing on upper, or lower end respectively, of the tile is ordinarily 2½ to 3 inches. Its exact length is governed by the individual form of each make of tile. It may be easily ascertained by measuring the diagonal cut on the upper right and the lower left corner. The length of the lap must correspond to the longitudinal dimension of either of the cuts mentioned. The ridge roll and edges of hips are trimmed with tile specially formed for this purpose, the latter are also fastened with nails when put in position.

Regardless of the fact that Spanish tile are popular among American builders and architects, I feel obliged to mention that, in my opinion, another pattern of roofing tile—the interlocking style, Fig. 4—is of greater merits to the economic builder. This kind of tile was originated in France and for the last few decades has been extensively used in that country as well as in Germany and many other European countries. It is also manufactured in most every roofing tile plant in America, as yet, however, lacks the deserved popularity. Its peculiar shape is, first of all, designed to facilitate air circulation through the roof and to transmit drops of condensed water from its lower surface to the outside, and last, not least, to produce a roof of sufficient tightness to prevent rain and snow from penetrating the interior of the building. Contrary to the construction with Spanish tile, the interlocking type may be laid directly on wooden strips, or on small angles if the whole structure is made up of steel. Thereby solid sheathing and under-roof are entirely eliminated and so the initial cost materially reduced.

Fig. 3 illustrates the usage of interlocking tile. With this method the necessity of nailing the tile is abolished, instead hooks are provided on every tile to project over the edge of the corresponding strip and hold the tile in position. A greater safety against wind may be obtained by anchoring some of the tile by wire on the inside of the roof in the manner illustrated. For this purpose each tile has a loop on its lower surface, through which the wire may be conveniently drawn. The loop being centrally located between the supporting strips enables the wire anchor to hold both ends of the tile equally well, while the ordinary way of nailing benefits the upper end of the tile only.

Occasion has often arisen to me to correct the erroneous opinion that, when tile are used the whole structure would have to be very much stronger to assure safe support of the heavier load. The fact that one square foot of tile roofing represents a weight of approximately three times that of a square foot of corrugated iron sheets prompts many people to presume that the structure carrying the former would have to be three times as strong as the one sufficient to withstand the load incident to a covering composed of corrugated sheets. This, however, is not so. Below I am presenting a comparison between different kinds of roofing. The figures used are obtained in part from the pocket companion of the Carnegie Steel Company and partly from the Engineers' Manual "Huette." As basis is presumed that the roofs bearing the different kinds of material have uniformly 30 degrees pitch and that the wind pressure is 30 pounds per square foot vertical projection; this equals a velocity of approximately 80 miles per hour.

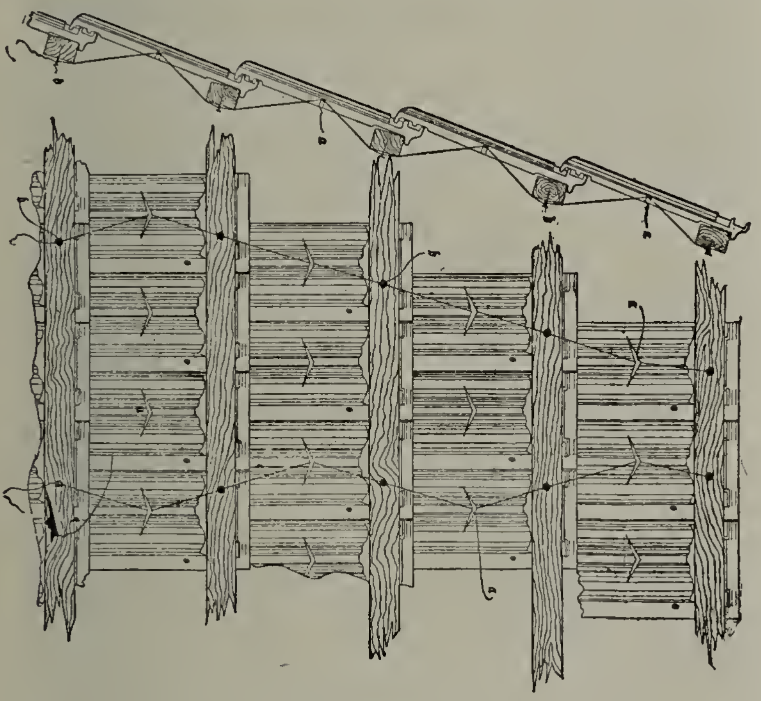


Figure 3.

	Tar Paper	Corrugated Sheets	Wooden Shingles	Slate	Interlocking Roofing tile
Weight of roofing material..	0.05	3.0	3.1	3.5	8.8
Sheathing, wood	2.2	..	2.2	2.2	..
Strips, wood	..	0.3	..	..	0.8
Rafters, wood	4.7	4.7	4.7	4.7	4.7
Average snow	10.0	10.0	10.0	10.0	10.0
Wind pressure, 0.66x30 lbs...	20.0	20.0	20.0	20.0	20.0
Total, pounds	37.4	38.0	40.0	40.4	44.3

The above table combines all the figures to be taken into consideration in determining the roof load, which subsequently furnishes the basis for the calculation of the supporting structure. Therefrom it can be seen that the actual increase in the weight incident to the use of roofing tile is only slightly in excess of 10 per cent. over that of common wooden shingles.

The man who never carries a burden of any kind is not really fitted for the enjoyment of rest and recreation.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

WERE IT NOT for the present car shortage, which has delayed the movement of brick, tile and other building materials, business conditions in the clay industry would be all that could be desired. The situation has become so serious that operations at clay products manufacturing plants have been held up waiting for cars to move the finished products which have accumulated to the extent that further production cannot be continued. Wholesalers and retailers are in a similar position in moving stocks, and there are actual cases where building operations have been held up by the non-arrival of material.

The labor situation in this market is such that it is almost impossible to secure sufficient help in any line of industry, and this being the case, the available supply of labor is in a position to dictate to the employers.

Despite these and other drawbacks, the conditions at present are much better than is usual at this late season of the year. There is a large amount of building going on here and in other Wisconsin cities. During the past month the building work authorized in Milwaukee exceeded that of a year ago by more than $1,000,000. There were 438 permits issued for $1,639,587, as against 367 permits and $637,937 for the same period in 1915. The totals for 1916 up to November 1, are 3,559 permits for $11,962,584, a gain of 122 permits and $1,713,502.

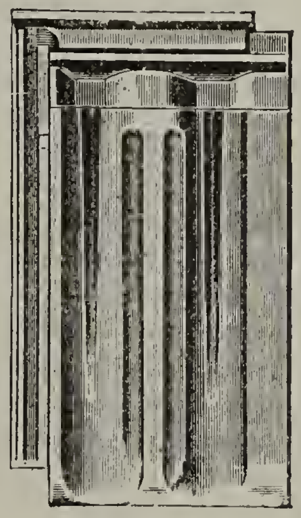


Figure 4.

Among the larger work authorized during the month of October, in which considerable brick will be used, are three large school additions, of solid brick construction, that at the Grant Street school, costing $72,000; the Lincoln Avenue school, $75,000, and the Wright Street school, $80,000. Two large brick apartments, each of which will contain twenty-seven flats, for John Hunholz, cost $95,000. The church of the Polish National congregation, at Hayes and Sixth avenues, is a $25,000 brick structure. In the industrial construction line there are the new plant of the Milwaukee Dairy Supply Company, costing $15,000; that of the Wrought Washer Company, $10,000; Milwaukee Auto Specialty Company, $15,000, and the Milwaukee Road warehouse and Allis station, $37,500.

The Wisconsin Face and Fire Brick Company, Caswell block, Milwaukee, secured a number of fine contracts during the recent period. This concern will furnish the face brick for the new $750,000, eight-story Main telephone exchange building of the Wisconsin Telephone Company on Broadway. This concern also secured numerous smaller contracts for face brick on new residences and apartment buildings.

Both the face and common brick being used in the construction of the fine new home of the Home State Bank at

South Milwaukee is being furnished by the Whitnall Coal and Supply Company, Caswell block, Milwaukee. This concern also supplied a large face brick contract in connection with the eight-story Miller Hotel, now under construction on Third street, north of Grand avenue.

Numerous orders are reported by the Stark Mantel and Tile Co., 819 Twenty-seventh street, Milwaukee, of which the following are included: Tile for the new confectionery store of McIntosh and Thompson and the Carlton Hotel, both at Edgerton, Wis.; the new Lohr garage at Hartford, Wis.; the two Hunholz twenty-seven-apartment building in Milwaukee; store and flat building for Louis Plous at Kenosha, Wis.; garage for the Munkwitz Realty Company, Broadway; three duplex flats at Clark and Forty-first streets, and three duplex flats at Center and Forty-first streets, all Milwaukee, and office buildings at Marshfield and Beaver Dam, Wis.

The newest industry at Whitewater, Wis., which is about to commence operations for the production of clay products is the Whitewater Brick and Tile Company. This concern was organized about two years ago by John C. Stier, who was formerly connected with the National Clay Works at Mason City, Iowa. The old brick and tile plant here was absorbed and plans put under way for establishing Whitewater's new and large manufacturing concern. The company is capitalized at $150,000, to manufacture brick, clay building block and drain tile. Clay beds which will furnish raw material for many years to come were acquired at the north end of Jefferson street. The construction of the new plant was then put under way. The yards were planned and designed by I. M. Justice, engineer for the Manufacturers Equipment Company, Dayton, Ohio. Fire-proof construction of tile and steel is used throughout. The raw material used will produce one hundred tons of clay products daily when the plant operates at capacity. Instead of firing the kilns directly, the big producers will turn the coal into gas, which will supply the eight burners on each kiln. A large storage room, 180x64 feet, has been constructed so that the products may be dried and stored regardless of weather conditions. The mill room is 108x64 feet, with two sets of dryers. Fans will direct the waste heat from the kilns and the exhaust steam direct to the big dryers. The boiler room and power plant are completed with a capacity to care for sixteen kilns. These kilns are 30 feet in diameter and spaced every fifty feet, and four of these are now ready for operation. The officers of the company are: D. F. Zuill, president; William McFarland, vice-president; Charles Walton, secretary, and John C. Stier, treasurer and manager.

A recent decision of the Wisconsin Railroad Commission was in favor of shippers of building material from that city. The Omaha road was ordered to adjust its rate to conform with that of Eau Claire for distances up to and including fifty miles, having found that the rate on these articles from River Falls was unjust and discriminatory.

The pottery plant of the Milwaukee Pottery Company, at West Allis, has been completed. The manufacture of fancy and glazed pottery will be commenced soon. The plant is a brick structure, 80x160 feet, equipped with modern machinery and four kilns. Louis Weis and H. F. Schuette are interested.

The Wisconsin Building Material Company has been organized at Schofield, Wis., by A. L. Kreuter, M. P. McCullough and R. E. Puchner. The capital stock is $25,000. The concern is authorized to buy and sell at wholesale and retail, brick, tile and other building materials, also to manufacture such products.

The board of public works at Stevens Point, Wis., favors the use of brick for the paving of Main street. There is a petition for brick pavement in this connection, but the use of stone was also advocated. Because of the expense of stone and the fact that this city has had a considerable number of its streets paved with vitrified block, which is giving splendid service, brick will undoubtedly be selected. The board considered the purchase of 40,000 No. 1 Purington block from Contractor Chris. Peterson, who finished considerable brick paving work here and had that number left over.

Henry W. Lutter, of the Lutter Brick Company, Chicago, was a recent visitor in Milwaukee. Mr. Lutter said that the condition of the brick business is very satisfactory, although the plant of his concern has been unable to secure enough cars to ship finished material.

Fifteen new brick buildings have been erected in the business district at Necedah, Wis., to replace the practically all frame construction which was destroyed by fire last winter. The entire district was devastated with a total loss of about $225,000. Following the illustrious example of San Francisco, business men at once set to work to reconstruct their business houses. However, they had received their lesson, and it was unanimously decided in favor of brick for the new buildings. There has been nearly $100,000 invested in the new work, while other brick buildings, including an opera house and motion picture theater, are to be erected. Of course, there is some frame construction; but if anyone is in doubt as to using brick for building purposes, the opinion of Charles E. Babcock and some other Necedah business men on this question will convince the most obstinate.

A. BADGER.

IDEAL MORTAR FOR BRICK MASONRY.

The Hydrated Lime Bureau of the National Lime Manufacturers' Association, with offices in the Arrott Building, Pittsburgh, Pa., has issued Bulletin J, describing what is termed "The Ideal Mortar for Brick Masonry."

It is stated that maximum strength at minimum expense in laying brick masonry can be obtained with a mortar mixture composed of one-half cubic foot of Portland cement, one-half cubic foot of hydrated lime and three cubic feet of sand, or proportions of 1:1:6.

Describing the properties of hydrated lime, it is said that when brought to a putty by the addition of water, it is the most plastic of any building material. It possesses a remarkable water-absorbing and carrying capacity, requiring practically its own weight of water to reduce it to a plastic state.

For years it has been known that the addition of a small amount of hydrated lime to cement mortar in brickwork results in a more plastic, freer spreading material under the trowel. The mortar being worked more easily under the trowel permits mechanics to more firmly embed the bricks, and with less physical effort. Bricks will slide freely and the mortar will be forced into the crevices, which insures a bearing surface for each brick. The practical effect, however, of such mixtures of cement and hydrated lime has always been a matter of debate until, according to this bulletin, Prof. James S. MacGregor, of Columbia University, established the actual facts beyond question. The experiments as conducted are given in detail in this bulletin, and the results obtained are discussed at length. It appears that mixtures of various proportions were used, varying from one cubic foot of Portland cement to three cubic feet of sand, to one cubic foot of hydrated lime to three cubic feet of sand. Between these limits the proportions of hydrated lime and Portland cement were varied as much as possible, and as a result it is found that the proportion first given, that of equal parts of Portland cement and hydrated lime, designated "Mortar No. 5," give the greater strength at less expense than the other mixtures. The reasons are set forth in Professor MacGregor's report, which is printed in full in this bulletin. Copy may be had upon application.

Do not let pass an opportunity to encourage young men to learn bricklaying, for one of the essentials to brick progress in building operations is plenty of men trained to bricklaying.

Written for The Clay-Worker.

SIDE LIGHTS ON MEN IN THE TRADE.

By William H. Burquest.

Where There's A Will There's A—Paving Brick Way.

"THERE IS NOTHING in a name." Some bright dub, who wanted to be smart, and whose name nobody can recall, inflicted that buncombe on mankind quite a spell ago. Whether that king was a poet, an after-dinner wit, or just a plain Adam Phool, is also not clear, for his elusive identity appears wrapped up in a nebulous state of antiquity.

Despite protestations to the contrary, there is undoubtedly a great deal in a name—more in some and less in others. First, there are letters in a name, and second, there is ink, either printer's or Carter's in it.

And to pursue the topic further, let us take the name of an ex-Hoosier schoolmaster who now abides in Ohio. Fate thrust upon this former pedagogue, and also ex-lawyer, the name of Blair in 1849, month, June 28, place, near Plainfield, Indiana.

Will P. Blair, Cleveland, Ohio.

Right off the reel, Will P., with all his will, started in to put the blare in Blair, for his first pair of lungs were surely lusty.

In later life, when he attained to years of manhood, and stepped forth to battle manfully with the world, he eventually made the discovery that although there may be nothing in some names, there must be something in his name, something he had hitherto overlooked. He was one day introduced to the fact that his initials, "W. P. B." had a world of significance—they stood for a great commodity in the field of industry, namely, "Will Paving Brick"—and by reversing the initials from W. P. B. to B. P. W., while driving along a gravel road in Indiana one day, he further perceived that the latter letters, curiously enough, stood for "Brick Paving Wanted." So, you see, whichever way he twisted that name of his, there was the vision and phantom of paving brick staring him persistently in the face.

Mr. Blair's interest in roads dates from the earliest constructed gravel roads in central Indiana, he having assisted in their building, and the imprint of his foot marked the green brick in his father's yard in childhood.

During his earlier manhood he taught school and practiced law for a few years. In his work as a teacher and lawyer he was conscientious and exacting. The records of the Supreme Court show that he won all of the few cases appealed by him to that jurisdiction.

His interest in mining and manufacturing soon required all of his attention. Whatever his private interests were, his interest in the welfare of the community in which he lived, and in those with whom he was associated, was never neglected. The leading daily paper of Mr. Blair's home city, recently, in speaking of him said, he was one of the biggest boosters who ever belonged to the commercial club and was always in the front for anything that would better Terre Haute.

The clay industry in western Indiana, which had its beginning with a French potter—a captive in the hands of the Kickapoo Indians—which grew to thirty-six plants in number in 1843, had been reduced to less than half a dozen potteries in 1885. To restore this industry to its former relative importance, and its present extraordinary development, he took an enthusiastic interest and bore a great share of the burden in the establishment of modern factories, for the manufacture of various kinds of vitrified clay goods in the western part of the state, now grown to immense proportions in output, men and capital employed.

For many years his personal effort was devoted to establishing and building up the plants of the Terre Haute Vitrified Brick Company, having served as its secretary and general manager for many years.

Not satisfied with knowing how to produce and market clay goods, of his manufacture, but deeming a familiarity with the proper use of the clay goods as essential to the best interest of the industry and in order to serve it at its best, he made himself many years ago, master of engineering features requisite in the use of clay goods. He has designed and built many houses and bridges of vitrified brick, which he believes will last as long as the world.

In the engineering branch of street and road construction, he has become particularly intimate, efficient and influential. His contributions of literature covering engineering features of brick and roadway building, are unequalled in completeness, accuracy of detail and of proven worth. Many examples of practical application of his construction directions demonstrate the great economy and satisfaction in the use of brick pavements when so constructed. Some of these are of his own supervision, such as the Indianapolis Motor Speedway, the Ithaca New York road, the sample at Chevy Chase, Maryland, for the office of public roads, and the South Columbus road for the Ohio Highway Commissioner. Thousands of streets and roads also have been built by engineers who have followed the manner and methods of construction advocated by Mr. Blair, for the last twenty-five years.

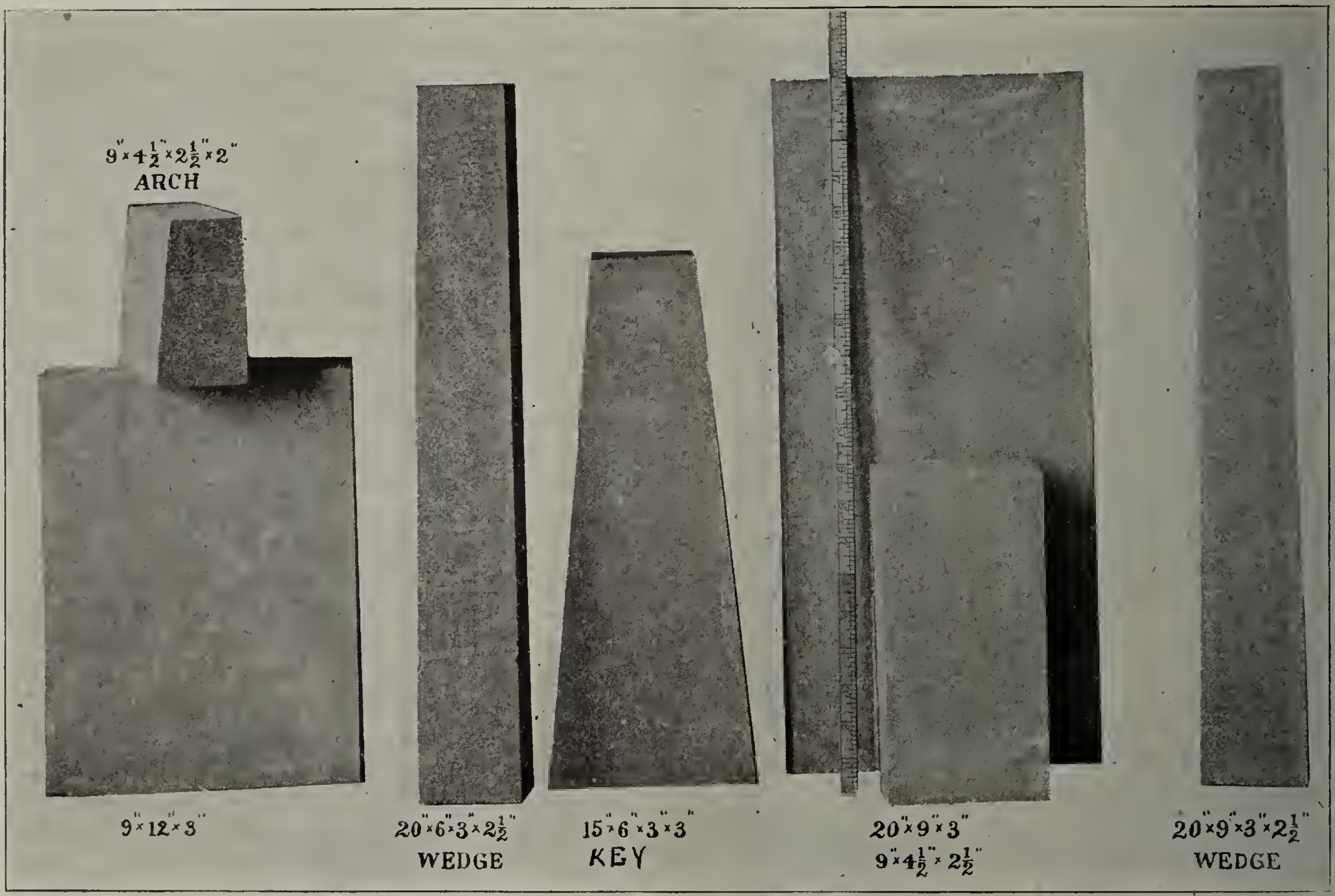
Where his construction methods have been adhered to, brick streets are popular. Not confining his efforts alone to brick, he has taught many American cities how to put in their granite and stone pavements.

Mr. Blair has been honored as the president of the National Brick Manufacturers Association, and has attended its sessions for many years, and has aided the efforts of all allied organizations to build up and foster the industry. He is a member of the Indiana, Illinois and Ohio Engineering Societies, The American Society for Testing Materials, and other scientific organizations. But his greatest service, and the one in which he takes most pride, is his connection with the National Paving Brick Manufacturers Association, serving as its first president, and for nine years, its secretary.

By his careful and scientific accuracy in demonstrating the merit of vitrified paving brick, the product has been placed clearly before the engineers and municipalities of the country. By his lectures before scientific societies, collegiate institutions and civic bodies, their use in the most advantageous way is understood. The lesson has been so thoroughly taught that the day is fast approaching when a city which does not build its brick pavements at their best, incurs the reproach rather than the material.

The value of his work as secretary of the National Paving Brick Manufacturers Association to the industry, is best comprehended by saying that the National Paving Brick Manufacturers Association, by its integrity and unselfish advice and counsel, and in the exercise of its educational functions, has been of the utmost worth to the cities and taxpayers.

May we anticipate that in no less degree will a like service be extended to the country, now approaching a vast expenditure of money for highway improvements.



The Variety of Sizes and Shapes of Fire

Potters at Trenton announce a 20 per cent. advance upon all table pottery, taking effect immediately. This is the second advance made within a relatively short time. The increased cost of labor—workmen going to munition factories—the cost of raw material and all other elements which enter into the production of pottery have forced this advance, they say in their statement. Inasmuch as the American potters are in virtual control of the American markets, there seems to be no reason why they shouldn't have another year as prosperous as the one just closing. The potteries have run continuously with a full complement of employes in most instances, and in some cases they have run nights to keep up with their orders. They are exporting some pottery now, which will help out the home market by preventing congestion.

THE MANUFACTURE OF FIRE BRICK.

Advantage of Machine-Made Ware Over the Old Hand-Made Product.

THE VALUE of the refractory products of the nation amounts to a very snug sum, the annual output of fire brick alone totaling something like $20,000,000, which entitles it to second place among the clay industries. This branch of the clay industry has not in the past been given the recognition to which its importance entitles it. Perhaps for the reason that refractory materials themselves do not come to the attention of the public as does building brick, etc. Then, too, the manufacturers of fire clay wares are all too modest, never seeking public recognition. Instead they seem to avoid the limelight, and by preference seemingly pursue the even tenor of their way without thought of their importance and rank as an industrial factor. As a fact, they are entitled to a high place in the industrial world, not alone by virtue of the value of refractory products, but as well because these products are so indispensable in the production of other important materials, as for instance, glass products. The latter could not be made without the refractory appliances supplied by our fire clay manufacturers.

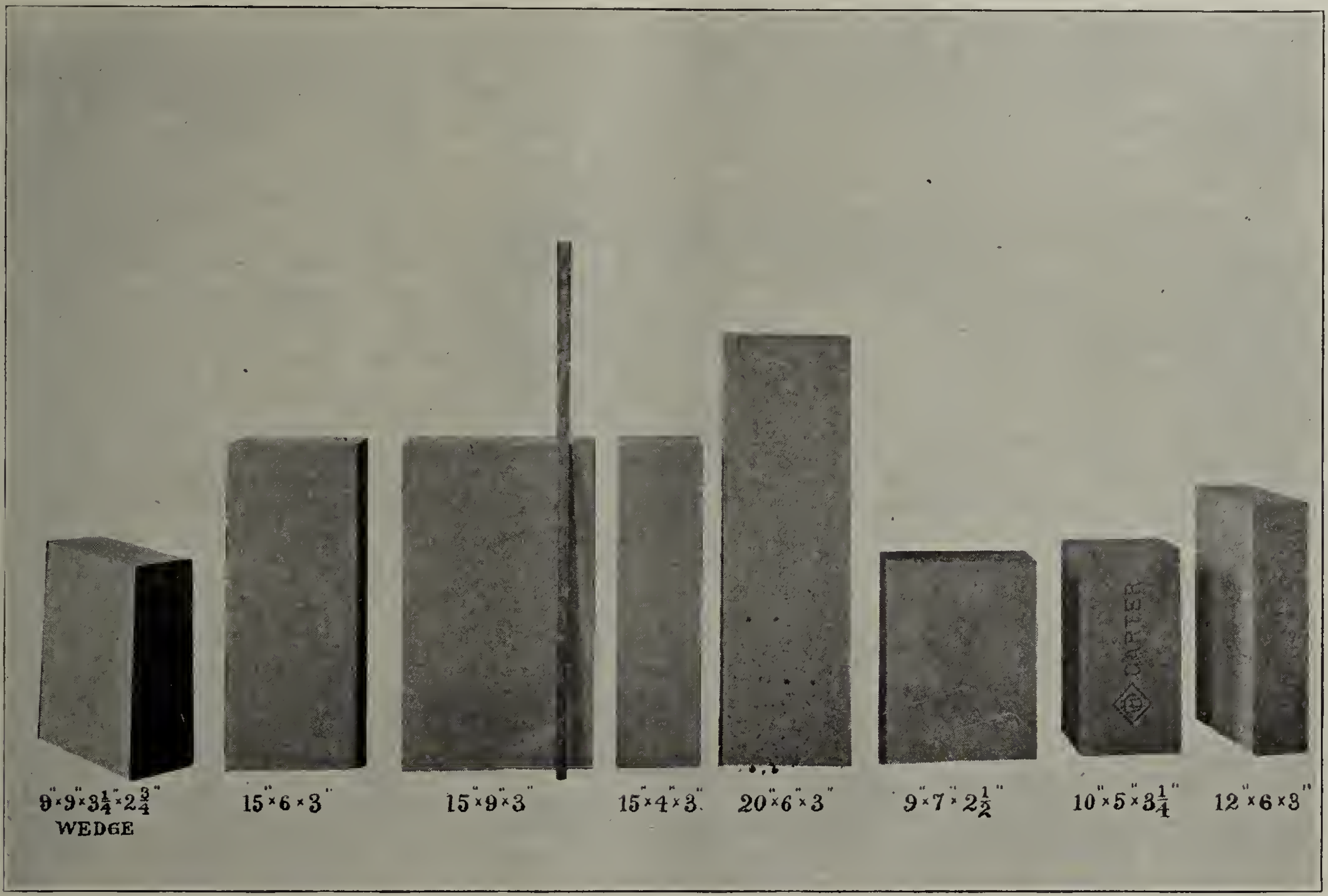
Though the refractory establishments have made but little noise in the industrial world, they have been very industrious and progressive, and have adopted improved methods of manufacture, and mechanical aids that have resulted in a decided improvement in product, and also a decided economy and an increased capacity, which of itself spells economy, one goes with the other. One of the important improvements now in vogue in many of the fire brick plants in America is the brick press, on which is now produced much of the ware that was formerly made by hand. Several years ago it was discovered that a fine high-grade fire brick could be made on a dry press brick machine. For a time, only ordinary small size fire brick were so made, but these proved so superior that larger brick and odd shaped block were added to the machine-made ware, until now the variety and various dimensions of machine-made fire brick are surprising even to clayworkers themselves, as was demonstrated when the delegates to the midsummer meeting of the American Ceramic Society were inspecting the plant of the Laclede-Christy Clay Products Company, St. Louis, where, to their surprise, they saw 12-inch block being made on a Boyd press.

The variety of sizes and shapes of block made on this press are really surprising, as our readers may see by the accompanying illustrations, for which we are indebted to Chisholm, Boyd & White Company, Chicago, the manufacturers of the Boyd press. The figures on the rule in the halftone are not very distinct, but they show that the longest of the block measures 20 inches in length. All of the brick shown in the illustrations, with one exception, were made at the plant of the Anaconda Copper Mining Company, Butte, Mont., on a special four-mold Boyd brick press, which has been in use there several years. The one exception, that branded Carter, was made on a similar press at the plant of the General Refractories Company, at Olive Hill, Ky. The variety of size brick and shapes indicate the adaptability of the Boyd brick press for making such ware. The capacity of the press, of course, depends on the size of the block made. It makes the following sizes:

Four brick, 13x4½x3 inches, at each stroke.
Three brick, 9x6¾x2½ inches, at each stroke.
Two brick, 9x9x3 inches, at each stroke.
Two brick, 12x12x2 inches, at each stroke.

The press can also be equipped with a mold to make one tile at each stroke, 24x13x2 or 3 inches thick, as desired.

For the 20x9x3-inch block only one mold is used, and the press produces one of these brick at each stroke. The same is true of the shapes 15 inches long. The Boyd press, which is illustrated on page 406 of this issue, is also used for making silica brick of similar sizes and shapes.



Clay Blocks Made on the Boyd Press.

Written for The Clay-Worker.

BURNED CLAY IN NEW YORK.

New York is still a burned clay city. That much can be demonstrated by even a cursory examination. Not only are common brick used extensively in the erection of its principal buildings, but terra cotta, fire-proofing, decorative terra cotta and special designs in all these are among the features of construction throughout the city.

To go through New York from end to end is, of course, manifestly impossible, but the tendency of certain neighborhoods can be discovered by going through a few streets in each locality. And an investigation of a number discloses the fact that burned clay is still the principal building material.

In the past cement men have created a great deal of disturbance, and the dust they raised was as thick as that which follows the failure of one of their buildings. But no indication exists that they have made even a small inroad upon the popularity of brick. Here and there a factory, a garage, or a stable, but no really important building in the past year in the metropolitan district constructed of cement. You see New York has somehow discovered its real usefulness and has utilized it principally for foundations, for which it is admirably adapted.

On the other hand, all the really important structures of the past five years have been of clay in one form or another. Some of it is made up in the most beautiful terra cotta. Others are plain brick, and still others combine these beautiful types of terra cotta and the newer styles of brick, whose colors are as varied as the uses to which they are put. You see the situation is considerably better than it was before the brick men saw the danger of their apathy and began the advertising which has attracted so much attention to brick and other forms of burned clay.

Brick buildings seventy-five years old or more jostle those which have been recently built, showing in a marked degree the changes which have taken place in burned clay in that period. New York is filled with these contrasts, than which it would be difficult to find a more striking demonstration of what has actually happened. Only a few trips to different neighborhoods are required to prove beyond question the essential popularity of this material. And these same trips will do more than that. They will show wherein the improvement has taken place and demonstrate, as nothing else can, the highly artistic character of the material turned out now. The old material was substantial. Constant use for many decades proves this, but it was not so highly decorative as that which is turned out now, and the architect was limited in his expression to the plainest possible decorative motifs. He put some on, but they were relatively unimportant as compared with the decorations in common use now.

Perhaps it is hardly fair to the manufacturing end of the industry to suggest that in some instances the architect overdoes the work and the decoration is too elaborate for his subject. But that may help in one way by deterring others from committing worse errors and thus jeapordizing the industry by making the material appear ridiculous. Since all such work must be comparative, it is better to keep it so than it is to undertake to make it superlative and thus prevent the realization of the artist's idea.

An example may seem sometimes in doorways which are framed in terra cotta, often in reproductions of highly satisfactory designs. These designs are frequently worked out in color and seem to more correctly interpret the idea of the door than anything which has hitherto been attempted. In many instances classical designs are utilized. In others they are plainly drawn, especially for the work itself, and might not be suitable for reproduction in any other position.

All colors are used, but the predominant ones seem to be dark, with a strong tendency toward the real terra cotta brown, or red. Glazed terra cotta is of varied colors, but greens and grays seem to divide popularity with the terra cotta brown and the brick red. Soft grays are frequently used with striking effect in situations where a dark color would cause an impression of gloom. This is the work of the artist and represents in some degree the progress which has been made in the past forty or fifty years. The contrasts are within easy reach and may be compared by any one who really desires to undertake the work.

The invention of what may be termed the rough texture bricks opened a new era in structural work, and New York has developed its share of the splendid results which have been worked out with these new surfaces. The rough surface and the artistic combination of colors have united to make possible a wonderfully satisfactory structure, in which soft colors are blended in as harmonious relations as in a picture. The artistic use of light and shade in the development of the architectural ideas, out of which have grown buildings which are the marvel of architects when the limitations under which the builders worked are considered. It is not easy to erect an attractive building in New York for the architect is limited to a certain number of feet, and his structure is surrounded in most instances by incongruous buildings which cannot be changed and which will not harmonize with anything he may do. With this fact in mind, the investigator interested in brick and terra cotta will find some surprising developments in the crowded streets of the city.

By working in the space he has with the plastic material which has proved so satisfactory for centuries, he is able to produce buildings which rank in architectural grace with those worked out in other materials where they are less confined. It is all because burned clay lends itself to wonderfully interpretative development. If the brick man doubts this, he can satisfy himself of the accuracy of the assertion by merely taking a little trip about the city and studying the results for himself. It won't take long to convince him of the essential truth of this statement.

And what is more important, perhaps, than almost anything else connected with this work, architects have only recently appreciated their opportunities to develop a new type of architecture which possesses its own grace and its own attractions. It is not the Parthenon of the Acropolis, but it is New York, and New York of the present century. What has been erected here during the past few years is typical of the age, the city and the men. What will come in the decade which is opening will probably more accurately interpret the spirit of the time than what has gone before. Learning from the mistakes of the past, the architect of the future, with this plastic material ready at hand, can develop buildings which will more accurately interpret the spirit of the men, brick man who observes will understand this and will also understand the fact that what is to come will exceed in beauty and adaptability what has gone before. In other words, the progress of the present will be far exceeded by the more suitable adaptation of the future.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

EVEN THOUGH the weather all through October was dry and favorable to brickmaking, most yards were restricted in their output by the labor situation, and some were forced to close. A great many colored laborers were brought from the South early in the season, but at the first touch of fall temperature they left in a body and hurried back to their own locality. Some of the most prominent yards in the state were left almost without men, and reported that it would be quite impossible for them to guarantee the delivery of any brick this fall. They therefore put the remaining force to work closing up, and now the yards are idle. They might have operated profitably at least another month if the laborers had been available.

The season all over the state has been disturbed by this shortage of labor. Those who formerly worked in brickyards went to munition factories or other employment which temporarily offered larger recompense. To replace these employes the larger brick manufacturers went south and got negro laborers. They worked well through the summer, but they refused point blank to remain at any price after the tingle of fall began. And so the yards were left, some of them with orders unfilled and with all sorts of complications to trouble them.

As a result of this brick at New Jersey delivery points has gone up to $8.25, and some are asking $8.50, while in other instances makers refuse to quote at all. No surplus is available to finish up the season and be ready for the early spring demand. Yards which commonly operate most, if not all, of the winter are closed, or are running with such a small force that the output is practically nil. It looks like a big-priced season next year, with all these complications to trouble manufacturers.

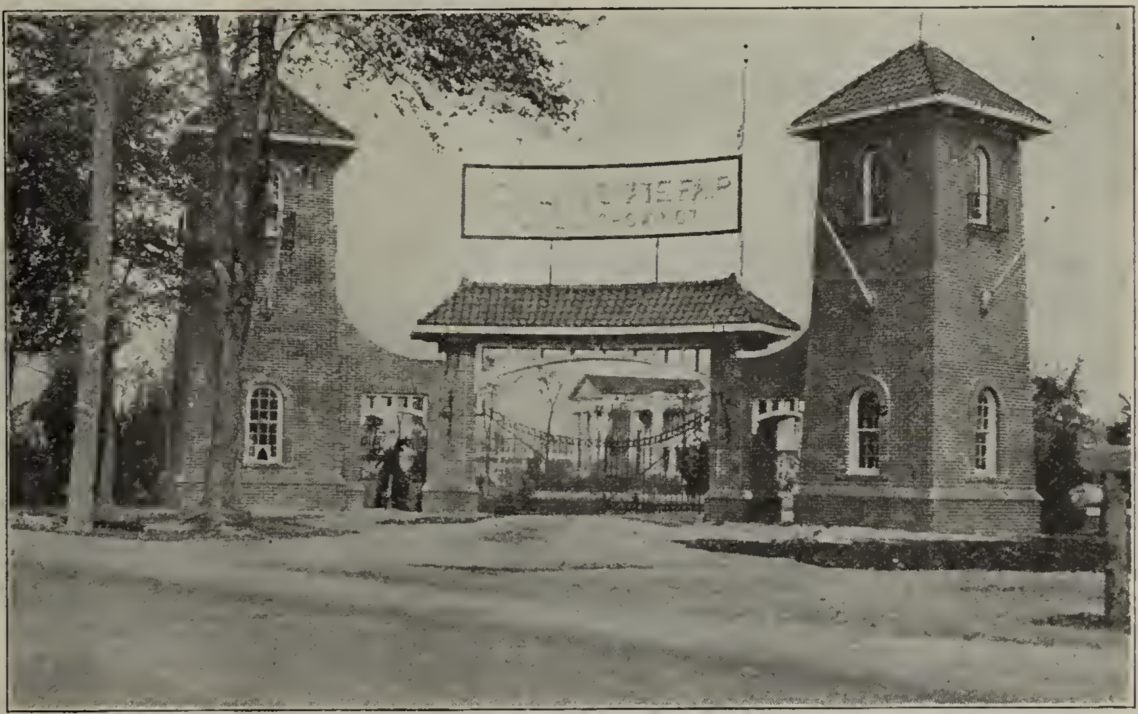
And along with this comes an enlarged demand for brick. It seems reasonably clear that cement has lost some of its prestige in New Jersey this year and that burned clay is taking its place. They are building factories of one story of cement, but the Edison fire caused projectors of factory buildings to pause and consider whether or not they should trust their valuable machinery and the employes in a structure which might fail, as that did, at the crucial time. The general effect has been to reduce the popularity of cement.

A number of silk mills have been erected in Paterson this year, and all are of brick; not a cement structure among them. One is trimmed with stone and another has a steel frame, but aside from these two examples brick is the material used in each building. The burned clay propaganda is exerting an influence which it will be difficult to overcome, more especially when failure after failure can be cited in support of the contentions regarding cement.

All the large cities of the state look forward to an active business next season. But builders conversant with the situation wonder where they are going to find brick to begin their operations in the spring. It looks now as though they will go short at the beginning. Newark is to have the greatest building boom in its history next year. Jersey City will follow close after it. Paterson is preparing for important developments. Trenton will grow more rapidly than it has heretofore. Camden is planning many improvements. The smaller places are in much the same position, and Hackensack leads with plans for a new high school, to cost a quarter of a million dollars. This is only one, but others are contemplating similar important structural operations. New Jersey will call for an immense amount of brick and fire-proofing, not to mention architectural terra cotta and many other products of burned clay for urgent use next season. And the difficulty which now confronts them is where are they going to get the brick? BURTON.

A BIT OF EFFECTIVE PUBLICITY.

THE ACCOMPANYING illustration of the main entrance to the Michigan State Fair Grounds is an indication of what can be done to boost brick and at the same time add to the ornamental setting of public utilities. This attractive bit of brick architecture at the entrance to the fair grounds brings to the minds of the thousands who visit that great agricultural show place the advantage of brick for effective architectural display. The well-to-do agriculturist who may be thinking of building a permanent home will be more apt to want to make it attractive after seeing a pleasing design of this sort, and he would be very apt to think of brick in that connection. He has always known that brick is the most durable material and a design of this character impresses him with the fact that there is beauty in brick as well as the everlasting quality, hence, it is a bit of effective publicity, even though it is not labeled "Build With Brick." The credit for this display is due to the Detroit Brick Manufacturers' and Dealers' Association.



Attractive Brick Entrance to Michigan State Fair Grounds, Detroit, Mich.

CEMENT IN THE SCHOOLS.

The extension division of the Portland Cement Association is very active in keeping the cement interests in the schools, and among its recent activities is co-operation with the David Rankin, Jr., Schools of Mechanical Trade of St. Louis, by getting out literature urging people to recommend the school to youngsters. Of course they take advantage of the occasion to suggest a study for a thorough knowledge of cement and cement work, and it all constitutes an enterprising bit of cement exploitation. It need hardly be added that introducing the boys to brick and bricklaying and other clay products while they are in school will help extend their acquaintance with and in the future use of these same products.

THE BUILDING RECORD.

Building operations, while not pushed as energetically as they might have been had not money and enterprise been directed so much toward industrial lines, have, nevertheless, been showing up very well lately and the fall building record is a decided improvement on that of the first half of the year. Also, it shows a healthy gain over the record for last fall. According to statistics compiled by the American Contractor, building statistics from the larger cities of the country show for September a total of $72,735,764, which is an increase as compared to last year of 6 per cent.

While, as would naturally be expected, a big part of the activity in building operations was in the eastern part of the country, there were many notable exceptions. For example, Charlotte, N. C., showed great gains, as did also Chattanooga, Tenn.; Jacksonville, Fla.; Nashville, Tenn., and over on the west coast, Portland, Ore.; Sacramento, Cal.; San Jose, Cal., and Tacoma, Wash., showed splendid gains.

Akron and Dayton, Ohio, had a very active fall season in building operations, as did also Harrisburg, Pa., but Hoboken, N. J., led the list with a total gain of 5,086 per cent., as compared to last year.

An interesting feature of the record is in the fact that more than the usual share of the buildings erected during the fall have been modest priced homes. It has been distinctively a year of home building. Home buildings and necessary factory buildings and warehouses have really made up the strong feature of the building record of the season. Of course, there have been some office and public buildings, but the activities of this kind have been limited, while the home building has been particularly active and has constituted the main feature of the year's building record.

It is too early yet to predict what may happen next year, but there is a lot of satisfaction to be had from the home building record of this fall. It indicates prosperity of the people at large and the desire to build better and more permanent homes. This means better communities and better satisfied people. Also a better outlook for brick, which is the final word in building material when people get into the notion of building for permanence.

WHAT ARE YOU GOING TO DO?

In Bulletin No. 7 of the National Lumber Manufacturers' Association, issued under date of October 29, 1915, there appears in blackfaced type the following paragraph:

> "Within the last twelve months the lumber industry of the United States has raised more than $400,000 per year for the organized promotion of the sale of its products. Large as this amount seems, it is by no means as much as can profitably be invested by lumber manufacturers for the expansion of their markets. Proper promotion is the best form of business insurance. Let the good work go on."

What are you going to do? Put this question to yourself, think over it carefully and then send the answer to Secretary Randall, of the Building Brick Bureau at Indianapolis.

A MODEL MODERN PAVING BRICK PLANT.

NINETY MILES WEST of Chicago, on the main line of the Santa Fe Railroad, is one of the most substantial suburbs of the Windy City, Streator, Ill. It is in the center of a rich agricultural district, but more important than that to her people is the fact that the entire district in and about Streator is underlaid with a rich deposit of fine shale, which averages about thirty feet in depth and from which the best grade of paving brick, sewer and drain tile pipe can be made, and has been made in vast quantities for nearly a quarter of a century. It is not surprising, therefore, that the proprietors of the Streator Clay Manufacturing Company, Messrs. R. H. and James A. Green, now operating the sewer pipe plant, which has been turning out high-grade glazed pipe for all sizes for, lo, these many years, and therefore are familiar with the superior character of Streator shale, and as well with the excellent economic conditions of the district, have purchased a large tract of land adjoining the sewer pipe plant and erected thereon a model modern paving brick plant.

A glimpse of this new factory is an inspiration to progressive clayworkers who delight in the establishment of improved factories equipped with modern appliances and planned on scientific lines which insures the production of high-grade clay ware at a minimum cost of labor and fuel. Such plants are interesting and mark progress in and for the clay industries that are very gratifying. They represent a large investment of capital, knowledge and skill, and indicate great faith in the future of the industry. In this particular instance the faith is born of an intimate knowledge of the business, for the Green brothers are growing gray in the clay game.

All Steel Tile Roofed Kiln Shed of the Streator Clay Manufacturing Company.

A Wise Procedure.

This model paving brick plant was first built on paper, a wise procedure, in the offices of the L. E. Rodgers Engineering Company, at Zanesville, Ohio, and the erection of the buildings, dryers and kilns and the installation of machinery has all been given the personal attention of L. E. Rodgers, who is a recognized expert and authority in clay plant engineering. Recognizing that fuel costs is one of the most important items in the production of clay wares, the use of producer gas was decided upon after careful investigation and the dryers and kilns have been planned and built for the use of that fuel exclusively. Another up-to-date feature is the operation of the machinery by electric power. The latter is supplied by the local power station. There will be no coal or ash piles in or about the plant. Coal will be conspicuous by its absence except at the gas producers, where it will be carried automatically and fed into the furnaces the same way.

At the time the writer visited the plant the finishing touches were being given to the electric installation, which will include pyrometers and other heat registering instruments suitable for the purpose in order to standardize the work and the product. Nothing will be left to chance or guess work. The machinery had already been limbered up and was running smoothly and steadily turning out pavers that looked awfully good. Fires were being started in the first chamber to be burned, and as soon as heat was up, the producers were to be started. By the time this story is in the hands of The Clay-Worker readers, the full daily quota of 60,000 paving brick and block will be the regular order of business. Barring unforseen accidents, the plant will be run six days in the week the year around, the kilns will be operated seven days in the week, as continuous operation is essential for the highest degree of efficiency in that branch of the work.

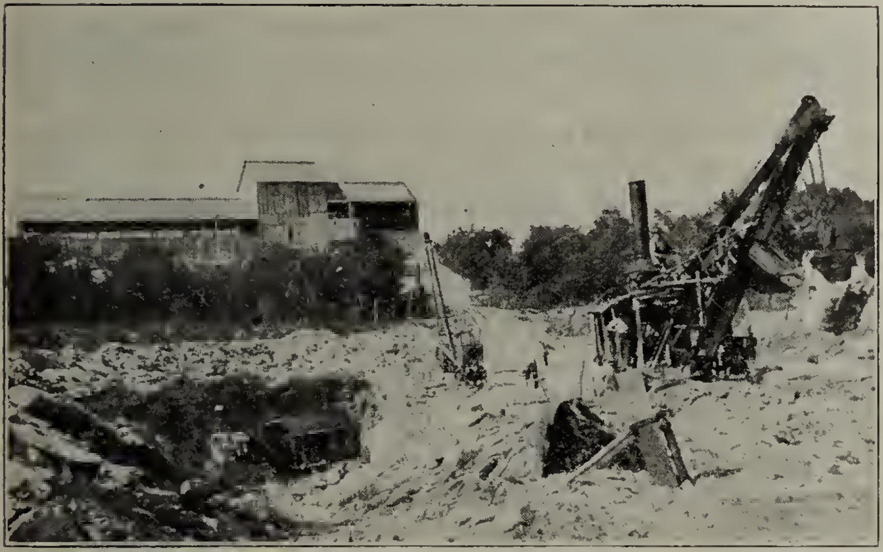
At the Shale Pit.

As stated, the supply of raw shale is inexhaustible. There is a surface deposit of earth and clay of four to six feet in depth that is removed by steam shovel. Then comes thirty feet or more of excellent shale, and beneath that a vein of coal a foot or two thick, which is used for firing the steam shovel and similar purposes. Two steam shovels are used, one for stripping and one for digging the shale, which it drops in side dump cars when it is run to the foot of an incline, where it is hoisted by cable and dumped into bins, from which, in turn, it goes to a large double jaw crusher, a first aid to the dry pans. After receiving the preliminary crushing, it is carried up by elevator buckets and dropped into a steel storage bin of nearly 300 tons capacity, from which it is fed by gravity either to the dry pans below or to dump cars to be conveyed to the sewer pipe plant, a half mile distant. All the shale now used at the old plant is taken from the new pit. The hauling is done by a Fate gasoline locomotive, which has made a hit with the operatives.

The shale for the paving brick plant is run through two Stevenson ten-foot dry pans and then screened (the coarse materials being returned to the pans) and again taken by belt conveyor and dropped into immense storage bins, from which it is taken through chutes in the bottom of the bins by belt conveyor to the pug mill. The storage bins hold enough shale for a month's run, thus insuring against a shortage of raw material. The machine equipment is from the Freese factory, at Galion, and is the embodiment of strength, "Dependable machinery of proven efficiency." Its daily capacity is 120,000 blocks, but it will only be run at half capacity until the present continuous kiln is duplicated. For the time being, the pavers are being repressed, three American represses being operated. Later on, a large portion of the output will be Dunn wire-cut lug block. The whole mechanical output is admirably arranged. The machine house is of brick and the kiln shed is of steel with a red tile roof, which is a conspicuous part of the sky line when approaching the plant from the city. It is a fire-proof plant, built for the next as well as the present generation.

Rodgers Dryers and Continuous Kiln.

The dryers are Rodgers waste heat double track tunnels, one hundred feet in length. There are nine of these tunnels with a total capacity of over 100,000 brick. When the continuous kiln is in operation, the dryers will be supplied with waste heat from the cooling chambers. Until that is done, the heat is supplied by a small automatically fired furnace. From the dryer, the brick goes to the continuous kiln, which consists of thirty chambers, each forty feet in length, twelve feet between flash walls and nine feet high. Each chamber holds about 27,000 brick, giving a total kiln capacity of 710,000. The gas goes from the producers into and through underground brick tunnels seven feet wide and the same depth, and extends the full length of the kiln. This manner of handling the heat, it is thought, will prove a decided improvement over the overhead flues that have heretofore been used in similar kilns. Up-takes leading to each chamber enables the operator to control the volume of gas and so maintain an even temperature. From the kilns the brick will go direct to the freight cars. The company has its own sidings, which extend on either side of the continuous kiln, enabling them to load the brick with a minimum of labor. They have direct connection with the New York Central and Wabash railroads.



The Thew Steam Shovel Starting Work at the Shale Bank.

The plant is destined to be the mecca for many who are in quest of information relative to the manufacture of paving brick. It has already been visited by representatives of the Bureau of Standards and by two foreign delegations, one from Russia and one from Japan. A cordial welcome awaits all who are sufficiently interested to pay them a visit. The officers of the company are: R. H. Green, president and treasurer; James A. Green, vice-president; John Connelly, secretary. The operative force is headed by Mr. George Connelly, manager; J. S. McCann, superintendent, and O. L. Helfrich, assistant superintendent. The latter is a graduate of the Illinois Clay School. He acted as our guide and has at his fingers' end all the facts and figures pertaining to the great plant. Mr. A. H. Yoder, formerly with the Alton Brick Company, has charge of the continuous kiln. His long experience with that type of kiln and his knowledge as a burner makes him an important member of the working force.

NOW IS THE TIME TO START.

It is doubtful if there ever has been a more propitious time than the present in which to start advertising. A number of factors seem almost to have conspired in favor of the concern which is just beginning to advertise, or the concern which never has advertised, but is "thinking about it." Now is the time to commence building a structure of good will for the years to come, and at no time within our recollection have conditions been more favorable for it.

In the first place, there is a tendency on the part of many concerns who are now advertising to cut down their space and relax their efforts because they are oversold. In many lines there is actually a surplus of orders which go begging from door to door, and the old argument, "Why should we advertise when we don't need more business?" is still potent. Dangerous as such a policy is, resulting often in loss of prestige, impairment of trade-mark values, a slump in the morale of the sales force, and a general letting down of efficiency on the part of the whole organization, there are many concerns who still follow it. Swamped with more orders from jobbers and dealers than they can fill, they allow the great consuming public to forget, thereby giving competitors the chance to cut in and make themselves known.

Again, an investment in advertising today will probably pay dividends more quickly than at any time in the past ten years. As we have said, there is actually a surplus of orders in many lines, an overflow, so to speak, which may be easily diverted into pre-arranged channels. A judicious campaign of advertising, inaugurated now, will not only start the foundation of future prestige, but will result in the gain of a larger share of that overflow business which at present is anybody's who shows the capacity to take care of it. In other words, instead of being obliged to win all of his business away from the established concerns, the new advertiser today can gather unto himself a lot of business which the established concerns cannot handle. All of which means, of course, that the initial investment in advertising will more quickly show a profit, that a larger number of actual customers will be reached, and that the momentum of the whole campaign will be greatly increased.

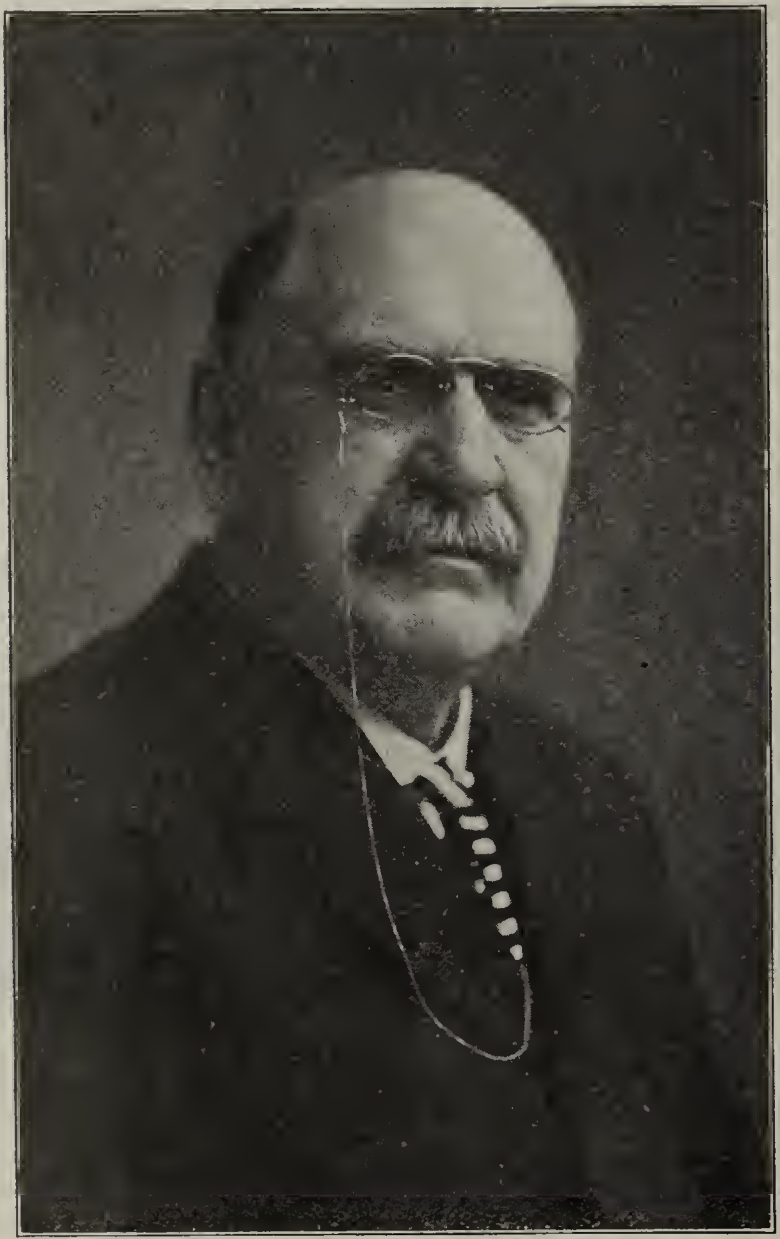
The Fate Gasoline Locomotive With a Train of Uncrushed Shale.

We do not doubt that some concerns will reply with the old—and specious—plea: "Why advertise when we are getting business without advertising?" That is like the excuse of the man whose roof leaked; when it rained he couldn't fix it, and while the sun shone it didn't need fixing, anyway.—Reprint from Printers' Ink Editorial of October 12, 1916.

OBITUARY.

Death of Frank Walter Bennett.

A PIONEER BRICK MACHINERY manufacturer, Frank Walter Bennett, died at his home, Wellington, Ohio, October 23. Mr. Bennett retired from active business life some years since. In the early days of the N. B. M. A. he was a conspicuous figure at the national conventions and had a wide acquaintance among the brickmakers of the country. He was a man of kindly character, who gained and kept the friendship of all those with whom he had business dealings. He was born in Wellington, December 5, 1842, and continued a resident of that town during his seventy-four years, taking an active part in village affairs for more than half a century. He served as a volunteer soldier during the War of the Rebellion. Out of respect to his memory, the schools were closed on the afternoon of his funeral, and during the hour of the services all business in Wellington in every line was likewise suspended. He was president of the Wellington Machinery Company for forty years. He is survived by his son, Roy C. Bennett, of Wellington; a brother, Charles Bennett, of Cleveland, and a sister, Mrs. Charles Kirk, of California.



The Late J. C. Brannock, Dayton, Ohio.

Wm. T. Walker Passes Away.

William T. Walker, president of the Walker & Frank Brick Company, Detroit, Mich., died at his home in that city October 19. His death was caused by heart trouble. Mr. Walker moved to Detroit from Birmingham, England, in 1888. Some years ago he became interested in the Springwell Brick Company, and later took over the business, when the firm name was changed to the Walker & Frank Brick Company. He is survived by a wife and two sons and two daughters. One of the sons, William W. Walker, was associated with his father in the business, being secretary-treasurer of the company. Mr. Walker devoted much of his time to his flower gardens, which was his pet hobby.

J. C. Brannock Dies After Brief Illness.

THE MANY FRIENDS and acquaintances of J. C. Brannock, who of late years has served in an executive capacity with the International Clay Machinery Company, Dayton, Ohio, will be shocked to learn of his death, which occurred there November 4. He suffered a cerebral hemmorhage the previous Thursday. He was a man of fine physique, good habits and strong character, hence his demise seems untimely. He had a host of friends on the Pacific Coast, where he was located for a number of years as a representative of the C. W. Raymond Company. He was a native Hoosier, having been born in Indiana in 1860. He is survived by his mother, Mrs. J. M. Holbrook, Owenton, Ky., and a daughter, Miss Helen Brannock, of Dayton.

NOTIFICATION OF CHANGE IN DATE OF THE DEDICATION OF THE CERAMIC ENGINEERING BUILDING OF THE UNIVERSITY OF ILLINOIS.

The dedication of the Ceramic Engineering Building of the University of Illinois, which was announced for November 20 and 21, has been postponed. It will occur on Wednesday and Thursday, December 6 and 7, 1916.

THE SECOND NATIONAL COMPLETE BUILDING EXPOSITION.

COMMUNITY EXHIBITS of the various lines of building materials promise to be prominent features of the National Complete Building Exposition, to be held in the Grand Central Palace, New York, March 5-11 of next year. Effort is being made to interest in this form of exhibit the several associations directing the welfare of the different fire resistant shingles, metal lath, brick, tile, terra cotta, cement and gypsum products.

Incidentally lumber will be represented in a decidedly impressive way. The lumber interests, quick to see the possibilities of the exposition and remembering the effect of the Cleveland show of last February, are planning on a large scale this time. The Southern Pine Association, the North Carolina Pine Association, the Arkansas Soft Pine Bureau, the Gum Lumber Manufacturers Association and The National Lumber Manufacturers Association have already taken two sections of four spaces each and probably at least four additional spaces will be taken by other hardwood lumber associations. The New York wholesale and retail lumber dealers probably will use the miniature houses with which the Cleveland Board of Lumber Dealers made their very effective display in the Cleveland show of last February.

In the community exhibits effort will be directed toward showing in the most effective manner the possibilities and the advantages of these several lines of material. In addition to the association exhibits there will be individual displays in each line, so the prospective home builder as well as the man who plans a factory, business block, theater, or has in prospect the building of a public building of whatever sort, will have an exceptional opportunity to see just what can be done with each particular product.

In extending the educational policy of the exposition special departments will be provided showing the latest development in church, school, theater and factory construction with a view particularly to emphasizing firesafe construction. For further particulars see ad on page 467.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

BUILDING PERMITS in the principal cities of the Pacific Coast have fallen off considerably in the past month, as is but natural at this late date; but construction work on a large number of important buildings under way will keep the majority of skilled mechanics busy all winter. There is a very small proportion of idle workmen of any description in San Francisco this fall, and if there is not a noticeable number of such in San Francisco, it is a sure sign that industrial conditions in the West are much improved.

In commercial lines prosperity is increasing also, and judging by many little signs, the outlook for next year is very bright. Architects have on the boards a vast amount of important work scheduled for erection next spring, and it is the unanimous opinion of the clay products people out this way that next summer will be one of the best seasons for building in the history of the state, that is unless unforeseen world conditions abruptly upset all present tendencies.

The coast lumber market has not kept pace this year with the brick market, and it is puzzling to account for this in full. Undoubtedly the curtailment of small building in the suburbs and country districts on account of advanced prices of building materials and uncertainty in the labor field have been chiefly responsible, as such building employs lumber almost exclusively in most sections. It is true, however, that the use of clay products for residences is on the increase, and it is seldom, indeed, that any school building or public or semipublic building of any sort is constructed of wood these days on the Pacific Coast. The common brick demand is still very strong by reason of the large contracts being delivered; face brick is moving even a little better than a month ago, and the terra cotta demand is about as good as it has been this year. The terra cotta demand has seen notable improvement in the past four months. The paving brick business this summer has been very fair in central California, but only a few firms are qualified to compete on this business, and as yet the bulk of the highest grade paving brick comes from one plant. The future of this department of the industry in California is assured, as it has now been conclusively demonstrated that the best paving brick can be manufactured economically close to the market centers. The various cities await only the assurance that paving brick is cheaper in the long run than any other kind to give it more hearty encouragement. Educational propaganda and test paving are gradually providing the proofs of the merits of paving brick, and with extended use of auto trucks the excuse for not adopting paving brick grows weaker and weaker. The season's consumption of vitrified sewer pipe has been very large, and the manufacturers are preparing for a larger output next year.

Mr. Funsten, of the Funsten Clay Products Company, has returned from a business trip in the San Joaquin Valley. He reports business on interlocking tile and other clay products very encouraging in the interior.

The California Brick Company, since it was reorganized a few years ago, has been pushing ahead very fast, and now the bulk of the paving brick in this particular district is supplied by the company. This company was reared upon the ruins of the old Oakland Paving Brick Company. With the introduction of additional capital and by reason of the progressive business and manufacturing policies in force, prosperity has come. The plant has supplied a million paving brick for San Francisco alone, and at present is unable to manufacture fast enough to supply the demand. The plant is located at Decoto, Cal.

After a period of service of nine years, A. S. Cunningham, manager of the Ione Fire Brick Company's plant at Ione, Cal., has resigned. He is succeeded by William Brown, of Ione.

Mangrum & Otter, Inc., 561 Mission street, San Francisco, have furnished the mat finished tiling for the new White Lunch place on Bush street. This is a special kind of tiling made especially for restaurant uses by a San Diego concern, for which Mangrum & Otter are agents.

The Steiger Terra Cotta and Pottery Works have been awarded the contract for supplying the terra cotta for the new Carnegie public library at Sacramento, Cal. The library building complete will come to a cost of about $130,000.

The Stockton Traffic Bureau, of which S. E. Semple is manager, has once more demonstrated its worth to shippers by winning a victory in a case submitted to the California State Railroad Commission. The case involved is that of the Stockton Fire and Enamel Brick Company against the Southern Pacific Company for overcharges on shipments of boulders from Midas to the company's plant south of Stockton at Hislop. It has accordingly been ordered by Commissioner Loveland that the railroad refund to the brick company any charge that may have been collected in excess of 80 cents per ton, the rate found to be the lawful rate for the class of material in question, subsequent to July 5, 1915. The refund to the brick company amounts to $805, and the yearly saving which will be effected is about $2,000. Other concerns will profit by this ruling, also.

The boys of the George Junior Republic at Chino, Cal., have burned more than a million brick for the new buildings of the institution, according to a report just issued. Experts say the brick made by the boys are as fine as any kiln products of the class turned out in southern California. Brickmaking is one of the courses taught to the four hundred odd boys at the Republic. Work on the new building will be commenced shortly by the boy mechanics.

It is probable that the building laws of Los Angeles will soon be amended to permit concrete or terra cotta flue vents for heating appliances in buildings. At the present time only galvanized iron is allowed in this class of construction. The public safety committee of the city council is recommending the amendment.

The latest new product to be manufactured by the Pioneer Brick Company, of Visalia, Cal., is hollow building tile. The company is doing a very satisfactory brick business. A contract has been signed for supplying 350,000 brick for the new Wasco high school, and the concern is also to supply 750,000 brick for the new Hotel Johnson in Visalia.

The plant of the Bend Brick and Lumber Company of Oregon is to operate all winter. Plans had been made to shut down, but continued demand for brick makes this impracticable.

After spending a year in experimental work and in developing a high-grade fire clay deposit in the vicinity, the Far West Clay Company, of Tacoma, Wash., has commenced the manufacture of fire brick at its plant near the city. H. S. Wheeler, vice-president of the company, says the new product has stood all tests most satisfactorily and that now the product is ready for competition in the open market. The brick has exceptionally high-heat resisting powers.

The Northern Clay Products Company, of Auburn, Wash., has been awarded the contract for supplying the terra cotta for the new Pantages Theater building at Vancouver, B. C.

Seven miles of the Des Moines road in King county, Wash., have been paved thus far by the Denny-Renton Clay and Coal Company, of Seattle. The pavement laid is of the monolithic type. Other highways will be paved with this brick later.

The Northwest Brick and Tile Construction Company, of Tacoma, Wash., has been awarded a contract for a million brick by the Tacoma Smelting Company. The same company will use 50,000 hollow tile in the improvements of the plant in contemplation.

San Francisco, Nov. 5, 1916. SUNSET.

WHEN WRITING TO ADVERTISERS
MENTION THE CLAY-WORKER
WHEN WRITING TO ADVERTISERS

OFFICIAL ANNOUNCEMENT.

Thirty-first Annual Convention of the National Brick Manufacturers' Association and Allied Organizations to be Held at Hotel McAlpin, New York, March 5-10, 1917.

AFTER THIRTY YEARS of meandering among the cities of the nation, it has at last been decided to accept the insistent invitation of Father Knickerbock and hold the thirty-first annual convention of the National Brick Manufacturers' Association in New York City, now the largest city in the world.

It is fitting that the oldest and largest association of clayworkers in the world should meet in the world's greatest metropolis, which awaits with glad hands outstretched to bid a hearty welcome to the makers of the one indestructible building material of which the city everlasting has been builded.

McAlpin Hotel, Headquarters.

The convention will be held the week of March 5 to 10, 1917, in the famous McAlpin Hotel, which will afford unsurpassed facilities, being the largest hotel in the world, and this, too, is meet and proper, for it is predicted that the attendance at the convention will be the largest in the history of the association. The attractions of New York and its environs, its drives and parks, its statues and museums, art galleries and public institutions, its churches and cathedrals, its unequalled harbor and its several great suspension bridges, its tubes, subways and elevated railway, its great terminal stations, the largest in the world, and its many varied places of amusement, appeal irresistibly to every one.

For these reasons, New York is becoming the greatest convention city in the world. Mr. J. R. Young, secretary of the Convention Division of the Merchants' Association of New York, is authority for the statement that organizations of all kinds are more largely attended in New York City than anywhere else.

The Complete Home Show.

An unusual attraction convention week will be the Second American Complete Building Show, which will be held in the Grand Central Palace, which affords unequalled facilities for such exhibits. The show will be given under the direction of those who so successfully conducted the first show in Cleveland last winter. The co-operation of the brickmakers of the country is particularly desired, with a view of making the show of utmost value to the building brick industry.

All Allied Associations Will Meet There.

As in former years, the American Ceramic Society, the National Paving Brick Manufacturers' Association, the National Clay Machinery Association, the National Building Brick Bureau, and other allied associations will meet in New York at the same time, and will be afforded unsurpassed facilities for their deliberative sessions and other functions.

The clayworkers of New York and vicinity are heartily in accord with the convention idea, and promise to leave nothing undone to make the meeting most memorable. A program befitting the occasion will be arranged. Members desiring any particular feature of the business discussed at any of the sessions are requested to communicate with the Secretary in regard to same. Those desiring information as to requisite of membership, etc., will please write to the Secretary at Indianapolis, Ind.

THE EXECUTIVE COMMITTEE,
Charles J. Deckman, President.
Theo A. Randall, Secretary.

New York and The Hotel McAlpin

THINGS TO THINK ABOUT.

The common brick business last year dropped down to a point in total value that only compares with 15 years ago and that was more than 15 million dollars below the banner years of 1905 and 1906. This year we have a chance by proper boosting to put the total of common brick above the 60 million dollar mark again. Will we do it?

Under the stimulus of a good export demand lumber prices are now advancing, which, while pleasing to the lumber fraternity, is also good for the brick business, because just a little more of this advancing and the first cost of a brick house will be less than one of lumber.

Written for THE CLAY-WORKER.

AMONG PHILADELPHIA BRICKYARDS.

The PAST MONTH HAS occasioned but little change in the conditions previously reported as dominating business with the brick manufacturers of Philadelphia, and the advent of November found the industry of this section of Pennsylvania enjoying a good winter demand for its products. Of the many different kinds of brick produced in and about this immediate vicinity, building brick continues to be the most wanted, and manufacturers of such products are still having their hands full in meeting the continued heavy demand. All the brick plants are still being operated at full capacity and will continue to actively operate until preventing weather conditions begin in earnest. Thus far prevailing weather conditions have been splendid, and building and construction work in general has been carried on with no interruption due to this annual cause. Just how long such weather will continue is naturally an unanswerable question, but it is a certainty that the present demand and rate of operation of brickyards in this vicinity will continue just so long as the weather holds good. Prices on building and sewer brick are holding firm at the recently reached higher level, while collections are such as may be considered seasonably good.

Vitrified paving brick conditions continue to show marked signs of inactivity, and no change in the present demand is now expected to materialize until the opening of next spring. Prospects for the coming spring and summer, and, in fact, for the year of 1917, with regards to the paving brick business in the East are generally conceded to be good. Much thoroughfare paving work has been planned by the various cities, towns and boroughs adjacent to Philadelphia, and in no little portion of such work it has been intimated that brick will be used. Thus, while the present year has not been an exceptionally satisfactory one with the vitrified brick interests in this district, the coming year is being anticipated with considerable optimism by local members of this branch of the industry.

A very interesting and animating lecture on "The Development of the Ceramic Industries in the United States" was given before the Franklin Institute, Philadelphia, on the evening of November 2, by A. V. Bleininger, ceramic chemist of the Bureau of Standards, of Pittsburgh. Mr. Bleininger's lecture, which was illustrated on the screen, was devoted to a discussion of the improved manufacture of structural clay products, refractories, pottery, porcelain and white ware.

Figures compiled by William W. Gamble, chief statistician of the Bureau of Building Inspection, show that during October a total of $4,055,045 of building work was prepared for in Philadelphia; this represents 880 permits which were issued for 1,337 projects. The total for this same month of last year aggregated $2,980,668. In issuing his monthly statement, Statistician Gamble, on behalf of the Bureau, issued a report on the amount of building work which had been either completed or let within the past ten months. During the ten months' period ending October 31, building work in this city aggregated $39,983,780, and this is more than was spent for building work in Philadelphia during the whole of last year, besides surpassing the building outlay record of any corresponding period in the past decade. Since January 1, the greatest volume of real estate business transacted in a similar period in many years has been recorded, and the total of deeds, mortgages and building records when compiled for this year is expected to reach an unprecedented number.

A splendid testimonial as to conditions confronting the brick manufacturers of the East as a result of the present freight car shortage is contained in a letter sent to the city of Reading, Pa., by the Prudden-Winslow Company, of New York, explaining why the company has delayed in the delivery of brick for paving work to be done by that municipality. The letter, in part, states: "We have in stock at our three plants 2,000,000 bricks and could load all that is required for your work in two days if we could only get the cars in which to load them. During our twenty-five years' experience we have never been confronted with the serious car situation that we have this year. Ordinarily at this season of the year we are shipping from twenty to thirty cars per day. As an indication of the seriousness of the situation at the present time, we would say that you can appreciate this when we tell you that our average car supply at the three factories is not two cars per day." A QUAKER.

A MOVEMENT TO BOOST THE N. P. B. M. A. THAT DESERVES SUCCESS.

At the last annual meeting of the National Paving Brick Manufacturers' Association two important measures were provided for, one was to institute a campaign of membership by each member endeavoring to secure the application of a manufacturer not now a member. There are scarcely sufficient manufacturers of paving brick to make it a one-man task. The office board have sent out letters to the members, however, asking each member to select someone upon whom he will exercise his persuasive powers to bring him into the fold. This campaign ought to be short, quick and successful. By January 1, 1917, there should be filed in the secretary's office, without a single exception, applications for membership of every manufacturer in the country not now enrolled.

Strenuous efforts are also being made to secure from every manufacturer statistical data in the year of 1917, by which the importance of the industry will be exactly known to the country. Not only the amount of brick manufactured and sold will be ascertained, but the information will disclose as to what sized towns, cities or country highways furnished the market for paving brick.

BRICK INSTITUTE TO DISCUSS LIVE TOPICS.

The forthcoming meeting of the Paving Brick Institute, to be held at the Statler Hotel, Cleveland, Ohio, on December 5 and 6, will discuss a program replete with valuable information to the operating departments of the industry.

Such subjects as "The Use of Powdered Coal," "Equipment Efficiency," "Producer Gas in Burning Brick" and "The Development and Application of a Bonus System," are of outstanding worth and give promise of a lively discussion.

The men to whom these subjects have been assigned have each given serious consideration to the particular one upon which they are to speak and many points of value to the industry will be brought out.

The meeting will close with a dinner on the evening of the 6th, for which a live program is being prepared.

The details of the meeting are as follows:

December 5, 10 a. m.—Meeting of program committee.
December 5, 3 p. m.—Meeting of the institute.
December 6, 10 a. m.—Institute meeting.
December 6, 6:30 p. m.—Dinner.

The meeting of the institute, scheduled for the morning of the 6th, will be continued for the afternoon, if necessary, or if time is available, there will be an inspection trip of interest to all members.

The following papers comprise the program:

"The Use of Powdered Coal," by Mr. A. A. Holbeck, of the Bonnot Company, Canton, Ohio.

"Equipment Efficiency," by Mr. F. R. Kanengeiser, of the Bessemer Limestone Company, Youngstown, Ohio.

"The Development of a Bonus System," by Mr. S. M. Duty, of the Medal Paving Brick Company, Cleveland, Ohio.

"Producer Gas in Burning Brick," by Mr. Underwood.

A paper by Mr. George D. Orr, of the Purington Paving Brick Company, Galesburg, Ill., on a subject on "Labor."

The caliber of the subjects and speakers should merit the widest interest and attention throughout the industry.

An important meeting of the cost committee of the institute will be called prior to the meeting, to prepare a report to be made at that time.

CORRESPONDENCE.

These columns are open to all. The full name and address is required, but will not be published except when permission is given. Those desiring to communicate privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

Meeting of The American Face Brick Association.

Editor The Clay-Worker:

We would appreciate your making announcement in your columns of the following departures from established precedent in the matter of program for the forthcoming annual meeting of The American Face Brick Association at the French Lick Springs Hotel, French Lick, Ind., December 6th, 7th and 8th:

1. There will be but one session of the membership of this Association each day.
2. The arrangement of program will permit ample opportunity for manufacturers and dealers to make appointments to discuss private affairs, which will not conflict with their attendance at the sessions of their annual meetings.
3. All manufacturers of face brick, regardless of membership in this Association, are cordially invited to attend all sessions.
4. No papers will be read, and nothing but Face Brick Business will be discussed.

Yours truly,
THE AMERICAN FACE BRICK ASSOCIATION,
R. D. T. HOLLOWELL, Sec.-Treas.

Institute of Paving Brick Manufacturers to Be Held at Cleveland, December 5 and 6.

Editor The Clay-Worker:

A special meeting of the Institute of Paving Brick Manufacturers was held at Statler Hotel, Cleveland, Ohio, October 21. The unanimous opinion of the members present was that two meetings a year with a larger and more complete program would be more interesting and successful.

The president instructed the committee on the Constitution and By-Laws to bring before the members at the next meeting, to be held at Cleveland, O., December 5 and 6, the revised sections of the Constitution and By-Laws to be voted on at that time.

You are earnestly requested to be present that your opinion may be known.

The program committee will have a very interesting program for this meeting, which will be mailed within the near future.

Yours very truly,
D. C. WILCOX, Sec'y,
Institute of Paving Brick Mfgrs.

Suggestion For Better Market Conditions—Better Prices For Brick Imperative.

Editor Clay-Worker:

We, like all of the balance of brickmakers, in the state of Pennsylvania, are suffering from a price depression and have vainly been seeking some relief from the present prevailing low prices and present prevailing high cost of manufacture and, it occurred to the writer that possibly The Clay-Worker might be used as a means of getting better prices for the manufacturers in this part of the country.

To illustrate what we mean, our present labor condition and high cost of coal compels us to attempt to sell brick around the $12.00 figure, as our cost has been climbing rapidly, until now it reaches the $10.00 point.

We have published our prices, that is, we have sent our price list to all our competitors in this part of the state, and that is about the extent of the work which we have done along this line. However, it has not accomplished the desired result and we feel that if each and every manufacturer should publish a list of his prices, in your columns, it would be of immense value to your patrons in letting them know what prices their competitors were selling brick for. Of course, this is something along the idea which Mr. Fiske has worked out, but the idea which we have in mind is to publish it in The Clay-Worker, rather than anywhere else, for the reason your journal circulates amongst our competitors and among the brickmaking fraternity at large, throughout the country and, we believe, if you could inaugurate a campaign along this line, it would result in a great benefit to the manufacturers.

J. P. WILLIAMS,
Milton, Pa. Manager Milton Brick Co.

Shrinking and Swelling of Brick.

Editor The Clay-Worker:

I would appreciate it very much if you would advise me how it is that in heating clay past vitrification and on to fusion, that it first shrinks and then swells?

F. W. TIETGEN.
Kansas City.

(This is a well known phenomenon. Practically every shale or clay will do this, owing to the fact that there are gases given off when the clay softens to a certain extent, which cause the well-known bloating or swelling. The Bureau of Standards has published a paper along this line which is embodied in Technologic Paper No. 17. A copy of this paper may be had by addressing the Bureau of Standards.)

A New Indiana Company Makes A Good Start.

Editor The Clay-Worker:

As you probably know, our company has only recently been incorporated, and we want to start right by subscribing for The Clay-Worker, and enclose $2.00 for that purpose.

When fully under way, we expect to manufacture a high grade fire brick, face brick, silo blocks, fire proofing and other clay products. The officers of our company are all men of experience, particularly the general manager, L. J. Beemer, who is also secretary and treasurer, having been connected with the Cannelton Sewer Pipe Company for many years. The other officers are Lee Rodman, president, and M. F. Casper, vice-president.

CANNELTON CLAY PRODUCTS CO.
Cannelton, Ind.

Address Wanted of Bauxite Brick Manufacturers.

Editor The Clay-Worker:

Can you inform me if Bauxite brick are being manufactured from Bauxite ore in either Georgia or Arkansas? Would like to get the addresses of manufacturers of this class of brick.

E. P. HAMLIN.

A Correction.

Editor Clay-Worker:

I notice in your October issue that in writing up the Thirteenth Annual Convention of The National Paving Brick Manufacturers Association, underneath the picture showing myself in conversation with Mr. Will P. Blair, you mention me a Secretary of the Akron Sewer Pipe Manufacturers Association. This is in error, as it should be Field Commissioner of The Sewer Pipe Manufacturers Association. I very much regret this error as our association includes members from other places as well as Akron, and would appreciate it if this can be corrected in your next issue.

Yours very truly,
JOHN L. RICE, Field Commissioner,
The Sewer Pipe Mfrs. Ass'n.
Akron, Ohio.

THE MISSION OF THE FEDERAL TRADE COMMISSION.

As a preparatory step to help the business, the Federal Trade Commission has been in correspondence with the associations and has been investigating various branches of industry to find out just how things stand with them and how the commission may help improve and build up business. One of the things they found that has made a deep impression is that business everywhere is suffering from what is termed unfair competition, which in turn is derived largely from guesswork as to cost and underbidding the other fellow to get business, regardless of whether it means profits or not.

Having found troubles of this kind in plenty, the Federal Trade Commission is setting about co-operating with business men through their various organizations, to help reduce this ruinous competition through a process of education on costs by a means of uniform accounting, and through developing an understanding of what constitutes a fair price below which there is not room for safe profits.

To put it another way, the Federal Trade Commission, which is a part of our government at Washington, is talking prices itself and is actively encouraging business men everywhere to get fair prices for their product—prices that will insure a margin of actual profits. They realize that for the country as a whole to be strong and stable and prepared to meet every emergency, the business of the country must be strong and on a good foundation and derive sufficient profits to insure its safety and continuation, and, realizing this, they are offering their co-operation to help bring it about. In this co-operation they are not only giving moral support to organizations, but they are actively encouraging their development, and in so doing speak frankly of prices. There is no more need for whispering when the subject of prices comes up, but it is a time for frank talking.

LOCAL ORGANIZATION NEEDED.

The Federal Trade Commission not only wants the bigger organizations, through which it can work with and co-operate with the industry on the larger general problems, but the representatives of this commission advise that when there are two or more people in a given community they get together and exchange information, for this is one of the things that is a great aid to industry.

Under these conditions it seems to be time for every branch of the clayworking industry to get together on the proposition of selling its product and getting the price. There has never been a period in the history of this country when conditions were more favorable, and in practically all other lines of business manufacturers and merchants, through the encouragement and moral support of the Federal Trade Commission, are taking steps to eliminate ruinous competition and to get better prices for their product—prices that will insure a respectable margin of profit. The people in the brick industry are just as human as other people, but in the past they seem to have been a little harder headed about this matter of getting together and solving the problem of selling the product for a price. The trade has gotten together and talked manufacturing methods and accomplished wonderful results in this respect. Now, however, we have before us another problem, one that is easily more difficult in some respects than that of solving some of the technical problems that have been unraveled. Also, we have before us the means by which this problem may be solved. It is simply a question of getting together and doing it. Shall we do so?

COAL AND CARS.

The scarcity of cars has been playing quite an interesting part in the coal situation this fall, and incidentally it serves to impress us with the fact that coal production and coal prices are often more affected by the car situation than by industrial conditions or by other conditions among the mines themselves. Coal goes from the mines directly to cars for transportation, consequently the mining operations during a time of car shortage are governed directly by the quantity of cars available from day to day. For about two months, at this writing, cars have been so scarce that coal mining has been curtailed practically all over the country, and in many important fields the output is no more than 40 or 50 per cent. of usual. Meantime the demand has been large and urgent, and as a result prices have advanced in some instances from 50 to 75 per cent. It makes quite an item in fuel cost, which is aggravated by the fact that deliveries are slow and uncertain. The coal business is, in a way, directly dependable upon cars and transportation, and for this reason, to the end that industries and the public may be protected and safeguarded against famine and exorbitant prices, there should be extra precautions taken by the railroads to provide against a shortage of cars. Moreover, it would seem to be within the scope of the work of the Interstate Commerce Commission to make some rulings upon this point which would safeguard the public interest.

LOCAL CO-OPERATION LACKING.

One great trouble with the brick industry seems to be a lack of local co-operation. This was very strongly impressed upon the writer recently in an interview with a brick man, who was lamenting the fact that it seemed impossible for brick men to get together and get a fair price for their product when in competition with each other. This man had been through some cut-throat competition and incidentally had bought in the property of a rival plant after his competitors had failed. Plainly the failure of the rival plant and the loss of profits to this man during the time of its operation were due directly to the fact that they fought each other strenuously with the price cutter.

The brick man said that he could look around him and see a number of laundry men in town who managed to get together some way and all get the same prices for their product. He saw lumber dealers who met in groups and co-operated to get a fair price, instead of cutting each other's throats and giving the consumer all the profits of the business until some one of them went broke. Ice men, merchants and seemingly everybody else but the brick men could get together and work out the selling problem in such a manner as to leave a fair profit for the business. On the other hand, he said it seemed that when there were two or more brick men in the community it was next to impossible to get them together and eliminate price cutting, because they all seemed to operate on the proposition that you must eliminate your competitor before you can hope to get a profit out of business.

Perhaps one explanation of this is in the fact that the brick trade, especially in its organization work, has considered the matter of price talking as a forbidden subject, as one which would lead to trust talk and "trust busting." There was some excuse for this feeling at one time, too, but conditions have changed wonderfully the past few years, especially in the matter of the federal government's relation to organizations and the getting of fair prices out of business.

This change has come about through that new government department known as the Federal Trade Commission, which started in to work some time ago with a view to becoming to the business and industrial world substantially what the department of agriculture is to the farmer; that is, of being helpful in a legitimate, practical way.

NEW YORK CITY LEADS THE WORLD.

New York City, which is to be the mecca of the next gathering of the clans in the clay-working industry, is now not merely the biggest city in the United States, and the center of many things pertaining to our own country, but it has attained the distinction of being the biggest city in the world in many respects.

Among other things, it has become the greatest port in the world. The commerce passing through the port of New York now amounts to over $2,000,000,000 a year. Stated another way, for the sake of comparison, the imports and exports passing through New York today exceed by $200,000,000 the foreign trade passing through London, which was formerly the world's greatest shipping center, but now takes second place with New York in the lead.

Clayworkers, of course, know something of New York's bigness in the brick trade, as this fact is brought home to us every time there is a compiling of statistics of the clay-working industry. New York is not only the biggest brick market in the United States but it is also a great manufacturing center in other lines. There are over a billion and a half dollars invested in manufacturing enterprises in New York City and the average value of their products runs close to $2,500,000,000.

It is partly because of New York's bigness in many lines not only of industrial enterprise but of literature, art, etc., that it has also become a great convention city where it is claimed the attendance at conventions, as a rule, are larger than when held anywhere else because people want to visit this big center, and the convention gathering furnishes the excuse and the opportunity. We are, therefore, looking forward to the greatest gathering of clayworkers ever known in the history of the industry at the annual N. B. M. A. meeting, which is to be held in New York the week of March 5-10, because New York has the attractions to make the trip worth while on that account, and then because there is need for a great getting together in the industry. So start in early to shape your plans so as to be one of this great gathering.

THE ALL IMPORTANT QUESTION OF COST.

Correct costs? There ain't no such animal. Experience has demonstrated that there is no such thing as a positive cost because of varying conditions and varying degrees of efficiency in management. Still while there is no such thing as positive cost there is such a thing as a uniform figuring basis, and that's the thing we want to get at.

President C. C. Blair, of the National Paving Brick Association, commented upon this matter a little in his annual address at the meeting held at Terre Haute and suggested that a committee be appointed to do some work on the matter.

This is what every association ought to get at and in getting at it it can easily have the active co-operation of the Federal Trade Commission which has connected with it some of the best expert accountants of the country. Moreover, they have issued a pamphlet touching on the subject of the fundamentals of cost accounting for manufacturers that ought to help start the ball rolling.

One of the expert accountants of the Federal Trade Commission in talking of this subject of costs before a convention of manufacturers cited the fact that at one time chaotic conditions reigned in the steel industry and things were so bad generally that a meeting was called. At this meeting the Carnegie people presented a cost sheet plan which was so well worked out that everybody adopted it and from that time till this everybody in the steel industry has used the Carnegie cost sheet, consequently, everybody figures uniformly in cost accounting.

This is what we need in the clay-working industry, a standard uniform method of figuring, not only a common method, but a common basis of accounting for certain items of cost, for it will take something of this kind to put the trade on a common and understandable basis for figuring prices. The man who can develop enough efficiency to get by at a lower cost than the standard will be entitled to that extra money anyway, and undoubtedly once we get the right kind of standard or uniform method for cost accounting we will be in a position to more uniformly get fair prices for brick. That is the point we are after, to get better prices and make fair profits. And it is argued that the best road to this end is through uniformity in cost accounting.

BOOSTING BRICK BUILDING.

While we have been disappointed at times with a lack of enthusiasm and co-operation in connection with the Building Brick Bureau it is evident that the Build With Brick slogan is at work effectively, and that people throughout the country are quietly boosting the brick building game in their home territory. An illustrative instance is reported from Salt Lake City, where it is said that brick manufacturers have developed residence building with brick to a high degree and are reaping the benefit of that Build With Brick campaign. They have reduced it down until they can build with burned clay as cheaply as they can build with lumber and the brick houses sell so much more readily that this form of construction has the preference. There are perhaps other parts of the country where equally effective boosting is being done. We hope so and also wish they would report what they are doing so that we may have the encouragement that comes from a knowledge that the persistent preachments of The Clay-Worker for brick boosting are bearing fruit.

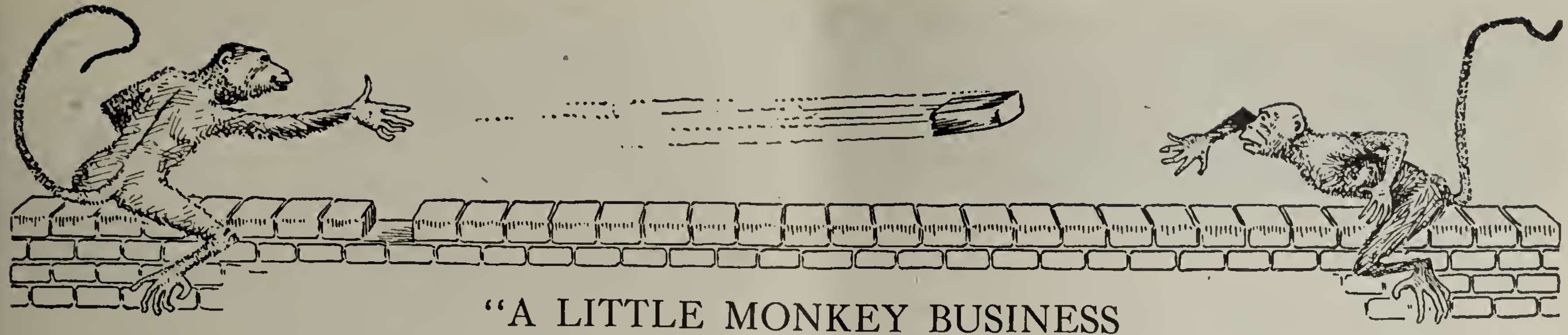
EIGHTH ANNUAL GOOD ROADS CONVENTION AND SHOW.

The next National Good Roads Show will be held in Mechanics Building, Boston, Massachusetts, February 5, 6, 7, 8 and 9, 1917, in connection with the annual convention of the American Road Builders' Association. The management is confident that the forthcoming show will far surpass any other similar exposition. The fact that the convention and show are to be held in Boston, almost the birthplace of the good roads movement, will alone serve to insure an attendance from every part of the United States. The facilities afforded by Mechanics Building for housing the exhibit and taking care of the convention are not surpassed in any city in the United States. The building is well heated and lighted throughout, and has a most comfortable convention hall, in which the association will hold the several sessions of its convention. The building is within easy walking distance of the leading hotels.

Exhibitors will assist the management by making their applications for space as early as possible, to E. L. Power, secretary, 150 Nassau St., New York City, so that space may be assigned at the first allotment; besides, exhibitors will be more certain to get space suited to their needs.

CLEVELAND COMPANY TO MAKE DUNN WIRE-CUT LUG BRICK.

The Cleveland Brick & Clay Company, of Cleveland, Ohio, has been added to the list of licensees of The Dunn Wire-Cut Lug Brick Company, of Conneaut, O., and henceforth will make wire-cut lug paving brick. The company is one of the most prominent paving brick manufacturing concerns in northern Ohio and it has a daily productive capacity of 60,000 blocks. J. L. Higley is president of the company, and A. L. Hendershot is secretary.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Biting.

Geraldine: I hate to think of my thirtieth birthday.

Gerard: Let's not bring up the past.—Chicago Herald.

* * *

The Way of Man.

Mrs. Wilkins: Did Fusleigh take his misfortune like a man?

Mrs. Williams: Precisely. He blamed it all on his wife. —Chicago Herald.

* * *

Pa's Advice.

Pater: Who is making that infernal jangle on the piano?

Mater: That's Constance at her exercise.

Pater: Well, for heaven's sake, tell her to get her exercise some other way.—Buffalo Courier.

* * *

The Ordinary Kind.

"What sort of a woman is Perkins' wife?"

"The ordinary kind. I guess Perkins has as much trouble with her as the rest of us do with our wives."—Detroit Free Press.

* * *

The Limit.

"We girls had hardships when we camped out—only one drinking glass among five girls."

"Horrors!"

"And only one mirror."

"Good night!"—Kansas City Journal.

* * *

Unanswerable Argument.

"I tell you," said Pat, "the ould fri'nds are the best, after all, and what's more, I can prove it."

"How are you goin' to prove it?"

"Where will you find a new fri'nd that has shtud by ye as long as the ould ones have?"—Answers.

* * *

Turning Away Wrath.

A gentleman who discovered that he was standing on a lady's train had the presence of mind to remark:

"Though I may not have the power to draw an angel from the skies, I have pinned one to the earth."

The lady excused him.—Tit-Bits.

* * *

Clever Henry.

She (tearfully): Henry, our engagement is at an end, and I wish to return to you everything you have ever given me.

He (cheerily): Thanks, Blanche! You may begin at once with the kisses!

They are married now.—Pearson's Weekly.

* * *

Economies.

"Why don't you wear some of your last year's clothes?" inquired Mr. Growcher.

"Why, father!" exclaimed his daughter; "didn't I have my last winter's furs made over and wear them all summer?" —Washington Star.

On Equal Footing.

First Stenographer—How do you like your new boss?

Second Stenographer—Fine; he doesn't know any more about spelling than I do.—Puck.

* * *

In a Safe Place.

First Undergraduate: Have you telegraphed the old man for money?

Second Undergraduate: Yes.

"Got an answer?"

"Yes. I telegraphed the governor, 'Where is that money I wrote for?' and his answer reads, 'In my pocket.'"—Baltimore Sun.

* * *

Coals to Newcastle.

Daughter—Father, our Domestic Science professor is teaching us how to spend money—

Parent (interrupting)—Why doesn't he teach fish how to swim?—Panther.

* * *

Sorry.

"I see Jack Hanson was married the other day to Miss Richley."

"Yes, I was sorry to see it."

"Sorry! For her sake or his?"

"For mine; I wanted her."—Pearson's Weekly, London.

* * *

An Unimportant Detail.

"The teacher says I will soon speak French as well as I speak English," said the enthusiastic girl.

"But you mispronounce many words."

"Oh, that's nothing. I mispronounce a lot of English words, too."—Washington Star.

* * *

Presence of Mind.

"Oh, John!" shrieked Mrs. Dorkin. "The baby has swallowed a silver piece."

Mr. Dorkins took a handful of change out of his pocket and looked it over.

"Calm yourself, Maria," he said. "It was that counterfeit quarter I've been trying to get rid of."—Brooklyn Citizen.

* * *

Putting It Too Strong.

She: So many men nowadays marry for money. You wouldn't marry me for money, would you, dearest?

He (absently): No, darling, I wouldn't marry you for all the money in the world.

She: Oh, you horrid, horrid wretch!—London Saturday Journal.

* * *

Poor Diplomat.

"I think the one you refused is much the more attractive of the two."

"I admit that, but when he proposed he went into ecstasies over how happy I could make him; but the one I accepted spoke earnestly of how happy he would try to make me."—Houston Post.

THE CLAY-WORKER

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THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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CURRENT COMMENT.

And now comes the closed season for the open yard brick plants.

* * *

An N. B. M. A. convention on Broadway is some novelty. Note the date, March 5 to 10.

* * *

The man who has to buy coal on the open market at this writing will have to revise his item of fuel cost.

* * *

The scarcity of ocean freighters was bad but the prevailing scarcity of freight cars is the thing that really hurts.

* * *

Mark that N. B. M. A. meeting date, March 5-10, in your calendar and begin planning to help make it the greatest ever.

* * *

The largest city in the world and the largest hotel in the world will surely attract the largest convention of clayworkers in the world.

* * *

If it didn't require both money and brains to do business there would be lots more competition than we now have, and generally we have enough as it is.

* * *

It is a pretty safe bet that fire clay products will score a new high record this year, for there has never been a busier year in the history of this important branch of the clayworking industry.

* * *

Evidence that this country maintains a pretty good sized water wagon is furnished by the statistics of the mineral water sold in the United States last year. These statistics show that there were 54,358,466 gallons of mineral water sold from 829 springs and that the total value was $4,892,328. New York, which leads in many other things, also leads in the water wagon list.

* * *

Old Higher Price had to hit the turkeys, too, but we can be thankful that pumpkin pies are still obtainable at reasonable prices.

* * *

We don't begrudge our steel friends their prosperity, but we would like to see structural steel get in shape to encourage rather than discourage building operations.

* * *

It is a good time now to be shoveling out literature to the farmers on the benefits of tile drainage—and it won't hurt to enclose a "Build With Brick" slogan along with it.

* * *

Good machinery costs more, but to hunt for bargains in cheaper machines is a poor road to economy and may cost much more in the end than to pay the price for the best.

* * *

We should be establishing some definite values for the raw material that goes into the making of brick and other clay products, and until we do the industry is not keeping books right.

* * *

The real answer to manufacturing cost can only be found afterward, so all preliminary estimates should carry a factor of safety to guard against the unexpected—which generally happens.

* * *

Where properly expended those enormous sums of money used for good road building constitute an investment rather than an expense, an investment that enhances the value of property all along the way.

* * *

The idea of preparedness is as old as the biblical story of the ten Virgins, but we clothe it in a fresh raiment of circumstances and thought every once in so often, and think we are setting forth something new.

* * *

We feel like offering a prize to the man who can name an important commodity that has advanced less in price during the year than common brick, and another to the man who can tell us the real reason why this is thus.

* * *

We want to see an early and earnest interest shown by the brick men in that building show that is to be held in New York in connection with the annual convention, so that the brick exhibit may be as conspicuous as it deserves to be.

THANKSGIVING.

"From too much love of living,
From hope and fear set free,
We thank with brief thanksgiving
Whatever gods may be."
—Swinburne.

The setting apart of a day in the early winter after crops are all harvested as a day of feasting and thanksgiving is some testimony to the fact that we are at heart an appreciative people even though the day is not always observed in the true spirit by all the people. The majority of people, however, observe this brief period of thanksgiving, and the main adverse criticism of the observance of the day in this country is that it is too brief a season to limit our thanksgiving to, and often the spirit of thanks generated takes on a rather selfish and narrow scope.

What we really need is to carry more of this spirit of thankfulness with us throughout the year and also to encompass in it more than the individual interest, the family circle or even the national life. This year we will find the day and its sentiment strongly flavored with patriotism, with a thankful appreciation of the greatness of our own country and the privilege of being a part of it. Moreover, the spirit of patriotism is good and should be encouraged, broadened and deepened. At the same time, however, we should realize that humanity and the world as a whole are one in the eyes of the Creator and there should be blended with our spirit of thankfulness for the blessings of our own country a feeling of fellowship and sympathy for others who seem less favorably environed at the present time.

An order of thankfulness which does not beget sympathy and kindly feeling for others less fortunate is not complete or well rounded out, neither does it make for wholesomeness in private or public life. The right spirit of thankfulness inspires some manifestation of its existence by extending sympathy and help to those who need it. So while we would not lessen in any way the spirit of patriotism which will flavor the day perhaps more strongly this year than ever before, we would ask that there also go with it a broader and deeper conception of the brotherhood of man, and that out of it there may come a more active kindliness not only of one toward the other here but toward all the people of the lands; and that the spirit may prevail throughout the year and not be confined or limited to the one day set apart for thanksgiving.

BRICK AND THE LUMBER DEALER.

Lumber manufacturers are naturally boosters for their own product, and they are actively boosting, too, and spending an enormous amount of money in a broad campaign of exploitation in which they have sought and obtained the interest and co-operation of the lumber dealers, that is the retail lumbermen with yards in the various cities and towns. Incidentally they have borrowed a catch phrase from the Build With Brick propaganda and are setting forth broadcast the injunction to build with lumber. When we get back of the noise, however, to the real ground work, we find that it is based on the theory of **lumber where lumber is best.** This is one point we can all agree upon. Also, there is another point which is getting a fair share of attention right now and is deserving of more, and that is the relation of the retail lumber dealer to the brick manufacturer.

WHERE CO-OPERATION WILL HELP.

There is undoubtedly room for some good co-operative work between the brick fraternity and the lumber dealers, especially in the smaller cities and towns, who commonly handle quite a line of other products in addition to lumber. Most of the readers of The Clay-Worker will recall a plea for co-operative work between lumber people and the brick men at Cleveland last year. Many other brick men have been showing more interest in this subject and right along many lumber men have been handling brick and other burned clay products more or less. They may be induced to handle them more and benefit themselves as well as help the brick trade by a little co-operative work from both sides in which naturally the brick man should take the initiative.

BUILD WITH BRICK SIGNS FOR LUMBERMEN.

Several times the suggestion has been made by The Clay-Worker that we may well have a new rendering of the Build With Brick slogan for the benefit of this branch of the trade. Every brick man in a position to do business with lumber yards may well have made a series of signs or calendar posters or something on which the catch line would be Build With Brick. Going with these should be other wording so that in effect the statement would be, "if you want to, **build with brick,** let us figure with you." These hung in the offices of lumber dealers would serve to advertise brick and also help keep the lumber dealer in touch with those who contemplate building with brick so that he could get into the game and handle the business.

There are several angles to the enlarging of the brick trade through the channel of the retail lumber dealers. In some cases it will be found practical for the lumber dealer to put in a stock of brick just as he puts in a stock of sewer pipe drain tile and other clay products. In other instances it will probably be more satisfactory all around for the lumber dealer to act as agent for the brick man making the sales on a commission basis so as to eliminate the trouble and cost involved in handling. This is seemingly the best plan where common low priced brick are to be handled in large quantities. In the handling of face brick there is enough margin to make room for the cost of handling and stocking, but on the otherhand there is a question of choice and variety which frequently makes it better to have sample panels and have the prospective builder make his selections from the list of the brick man's product and then ship the stock direct. It is good business for the lumber dealer to carry some stock even of common brick, however, because there are always more or less retail trade buyers who want a limited quantity for building flues or something of that kind whose needs are immediate and can only be properly served by a stock of brick on hand. Quite a number of retailers already make it a point to carry such brick and others might be induced to do so if each brick manufacturer would seek out the trade in his territory and cultivate it.

THE CEMENT PEOPLE DID IT.

The cement people recognized the importance of the lumber yard man as a distributing agent for their product quite a number of years ago and went after the development of this trade systematically. In doing this they stimulated the interest of the lumber dealers and encouraged them to take up the subject of cement actively, with the result that it proved a great boon to the cement industry and cement on the other hand proved a profitable line for the retail dealer. What the cement people did the brick manufacturers can do, and even improve upon it, for brick is gaining in favor on all sides all the time and is being considered as a material for home building in everything from the modest cottage to the mansion. The wide awake retail dealer is beginning to recognize this and to wonder a little about the future of his business, and practically all of the retail yard men can be made to realize this impressively by proper effort on the part of brick manufacturers. And since it can be shown that it is to their interest as well as to the interest of the clayworking industry to get in line and help push the product, the time would seem to be ripe for some active mission work along this line with this class of people.

A GOOD CHANCE FOR FACE BRICK.

It presents one of the finest opportunities of the day for face brick manufacturers who are very earnestly concerned with the propositon of displaying and exploiting face brick in its many textures and colors. The retail lumber yard is the center of information of the community for building material and the retail lumberman is the proper man to be supplied with samples of face brick and literature upon the subject of brick architecture. And, of course, there are opportunities for common brick, terra cotta and every line of clay products which enter into a building, opportunities for display and exploitation of them on the part of the retail lumberman to the advantage of all concerned. The retail lumber dealer is recognizing the fact that he must be a retail dealer in building material, not merely a retail dealer in one or two lines of it, and whatever line of material gives promise of trade holds a lively interest for him.

THE ITEM OF SEWER BRICK.

While brick is a sort of central feature of this idea of extending trade lines of clay products through cultivating and co-operating with retail lumbermen, it is not by any means the only material involved that needs attention or may profit from efforts at proper exploitation. Take sewer pipe as an item, in addition to building brick and hollow clay tile, and we have here again something that is quite familiar to many in the retail lumber trade. They have found it necessary to carry some to supply the needs of their customers. Heretofore, however, this trade has been rather small and unimportant as compared to the possibilities of expansion that are before us now. The home builders, even in country districts, today consider the bath room as one of the essentials of the modern home. This in its turn calls for something in the way of local water works and for proper drainage and sanitation, which naturally means sewer pipe and private or individual sewer systems. The sewer pipe trade in the country districts is really just in its infancy so far as its magnitude is concerned and the next few years should see wonderful developments there, especially if there is proper co-operative effort and exploitation. It is there, too, in the country districts that educational campaigns, that exploitation of the right kind will bring greater things and larger results than in the larger cities where sewer pipe is just as naturally turned to as the architect turns to brick when he plans for a pretentious building. Boosting of the sewer pipe trade should go hand in hand with the "Build With Brick" slogan in the country town districts, and it should profit just as much from exploitation, and increase in volume of trade, practically in proportion to increase in building brick and other clay products that enter into home construction.

EXPLOITING DRAIN TILE.

Drain tile is another familiar item that has been handled some, but perhaps has not been exploited as strenuously or persistently as might be. The drain tile business is one of varied parts; in some sections of the country it is rather localized and there are numbers of comparatively small manufacturers of drain tile who figure upon serving the nearby territory. In other sections, there are larger manufacturers who distribute their tile in car load lots over a much wider field. But the large and small, however, should find it beneficial to seek the co-operation of retail dealers. The difference would simply be that the larger manufacturer would seek this cooperation over a larger field than the one of limited capacity and territory. The retail lumber dealer, as a rule, is not very busy during the winter months and he is very anxious to take up materials that will help employ his time and bring business. This is the time of active exploitation of drain tile, of planning and installing, therefore the conditions surrounding the trade naturally make for co-operation, and in many instances the retail dealer in a community can, once he is interested, help materially to spread the doctrine of tile drainage and to enlarge the consumption of this useful clay product.

THE RETAIL ASSOCIATION.

One of the things that makes the retail lumber field an inviting field for exploitation is in the fact that it is easy to get at the members of the trade, for most of them are wide-awake and the more progressive of them are usually members of some local or state association. There are retail lumber dealers' associations in nearly every state. The secretaries of these associations maintain lists of the retailers of the state. It is easy enough to get these lists and it should be worth while to find out the dates of the annual conventions, and make it a business to attend and mingle with them. Of course, it is not practical for every manufacturer of clay products to attend every convention of retail lumbermen in the country, but practically every man in the clay products business can attend some one or two of such conventions in the territory where his interest is centered. Perhaps not so much can be accomplished directly at the conventions except the important thing of getting acquainted with some of the leaders in the trade, but it makes a good starting point and brick manufacturers should be able to get clay products down as a subject for some of the discussions in the conventions and in this way arouse a livelier interest in the subject. It is a subject already discussed through the lumber journals and is an appropriate one for conventions, and at conventions is a good place to get acquainted and get a line on the possibilities of the trade. The cement and plaster people have recognized this fact and have been busy in the field for a good many years. It is time for the clayworkers to get into this thing more actively now and see that clay products have proper presentation to this big army of dealers in building material. It is one of the biggest fields open for extending lines of trade in quite a number of important branches of the clayworking industry, and the chances for a much larger harvest from proper cultivation are so good it should not be neglected. Every clayworker in the country should get busy and mobilize his resources, and concentrate a lot of his effort during the winter toward the developing of a bigger and better trade through this channel.

THE TRUCK AS A BRIDGE FOR DISTANCE.

One of the most noticeable features developing out of the use of motor trucks for handling brick and other heavy material is in the way the truck bridges distance. After the truck is loaded, the matter of distance is a comparatively minor item, whereas in the case of horse and wagons it used to be quite a factor. It takes only a few minutes to cover a mile with the motor truck and so long as there are streets or roads to carry it, it will go without let-up and without getting tired, and the result is that in the distribution of brick and other building material in some of the larger cities there is a tendency to do away with branch warehouses because the trucks serve the purpose. Sometimes a prominent manufacturer or distributor found that for the accommodation and prompt service of the trade it was advisable to have several distributing yards or warehouses from which the teams could make deliveries in shorter hauls. These cost money to maintain and it also costs money to ship the material to them and handle it. Now it is found that with the truck, one good central distributing point is all that is needed, even in the large cities, because the trucks can cover the distance and serve the trade promptly over a much wider territory than was practical with horses. This in a way constitutes one of the most interesting features that has been developed in connection with the use of motor trucks for handling brick and other heavy building material.

THE COMPLETE BUILDING SHOW.

As will be observed from the official announcement for the thirty-first annual convention of the National Brick Manufacturers Association and allied organizations there will be held in conjunction with this the Second Complete Building Show, a repetition on a larger and more elaborate scale of what was done at Cleveland and with the same enterprising workers back of it.

This is not simply a clay products show but a show in which there will be entered and displayed every kind of offering in the way of building material. Just how conspicuously brick and clay products will appear in this show depends directly upon the activity and co-operation of the clayworking industry itself. Naturally, we would like to see the clay products overshadow everything else because we earnestly contend that there is no other building material to compare with burned clay. It can be made to overshadow everything else, too, by all working together for that end.

Let us start in early and not wait for "George" to do it, nor until the time becomes so short that the work cannot be carried out right. We want to see it the best showing of clay products ever put up and to the end that it may be this and that every visitor to the convention may be proud of it, let us all join in the work early and earnestly and help to make it a big boost for brick as well as the best building show ever gotten up.

MORE TRUTH THAN POETRY.

Cheer Up!

SUPPOSING the man that you worked for was licked;
Meet your defeat with a smile.
It is over and through and there's nothing to do
But work for yourself a while.
You may apprehend that the nation is lost,
But stifle that heart-breaking sob.
You still are alive, and you'll likely survive
As long as you've not lost your job.

YOU won't have to argue for Wilson or Hughes,
Or Cap for their game any more;
You can cap for yourself, and accumulate pelf
To stand off the wolf from your door.
Your hero, of course, may have lost a whole lot,
But that needn't drive you to crime;
Let them shed the tears; you can give three cheers,
For all you have lost is your time.

GO back on the job; it will do you no good
To mourn over votes that wern't cast;
You will get no relief for your burden of grief
In thinking about the dead past.
Wake up and get busy; the shock of defeat
Can't knock a real man off his pins.
Get back to the grind and next year you will find
That you'll be the fellow that wins!

—Exchange.

JAMES WHITCOMB RILEY.

Written July 22, 1916, When the World Lost Its "Poet of Childhood."

There must be great rejoicin' on the Golden Shore to-day,
An' the big an' little angels must be feelin' mighty gay:
Could we look beyond the curtain now I fancy we should see
Old Aunt Mary waitin', smilin', for the coming that's to be,
An' Little Orphant Annie an' the whole excited pack
Dancin' up an' down an' shouting': "Mr. Riley's comin' back!"

There's a heap o' real sadness in this good old world to-day;
There are lumpy throats this morning now that Riley's gone away;
There's a voice now stilled forever that in sweetness only spoke
An' whispered words of courage with a faith that never broke.
There is much of joy and laughter that we mortals here will lack,
But the angels must be happy now that Riley's comin' back.

The world was gettin' dreary, there was too much sigh an' frown
In this vale o' mortal strivin', so God sent Jim Riley down,
An' He said: "Go there an' cheer 'em in your good old-fashioned way,
With your songs of tender sweetness, but don't make your plans to stay,
Coz you're needed up in Heaven. I am lendin' you to men
Just to help 'em with your music, but I'll want you back again."

An' Riley came, an' mortals heard the music of his voice
An' they caught his songs o' beauty an' they started to rejoice;
An' they leaned on him in sorrow, an' they shared with him their joys,
An' they walked with him the pathways that they knew when they were boys.
But the heavenly angels missed him, missed his tender, gentle knack
Of makin' people happy, an' they wanted Riley back.

There must be great rejoicin' on the streets of Heaven to-day
An' all the angel children must be troopin' down the way,
Singin' heavenly songs of welcome an' preparin' now to greet
The soul that God had tinctured with an everlasting sweet;
The world is robed in sadness an' is draped in sombre black;
But joy must reign in Heaven now that Riley's comin' back.

—Edgar Guest.

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CONFERENCE ON FIRE TESTS OF WALLS AND PARTITIONS.

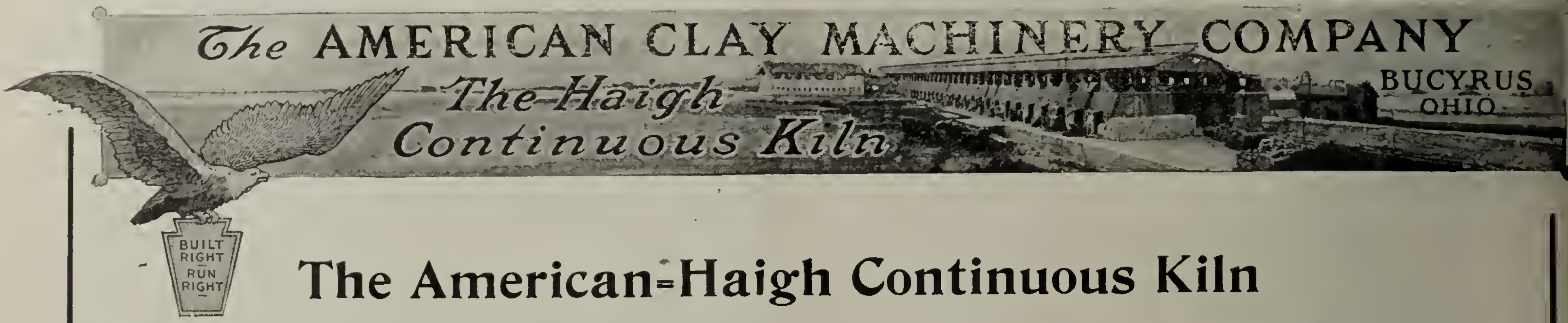
A conference has been held at the United States Bureau of Standards by representatives of various technical associations for the purpose of drawing up a comprehensive program of fire tests for building walls and partitions. Those who participated gave their attention to metal-lath-and-plaster, stucco, gypsum, hollow-tile, brick, and concrete partitions and walls.

Many important details governing these tests were considered, such as types and dimensions of partitions to be tested, the temperatures to which the partitions are to be exposed, the time of exposure to fire, the water test to which the heated partitions should be subjected, etc.

Participating in the conference were representatives of the American Institute of Architects, the American Society for Testing Materials, the National Board of Fire Underwriters, the Associated Metal Lath Manufacturers, the Gypsum Industries Association, the National Brick Manufacturers Association, the Association of American Portland Cement Manufacturers, and the Fire Underwriters' Laboratories. Other associations represented on the advisory committee for these tests are: The American Concrete Institute, the National Fire Protection Association, and the National Lime Manufacturers Association.

The fire tests outlined by the committee in co-operation with the representatives of the Bureau of Standards are to be carried out with the panel furnace recently installed by the bureau. It is the largest and most complete plant for such work ever built. It is confidently believed by the committee that these fire tests will have an important bearing on all fire-resistive building construction.

Ask for One of Our American Flag Bows Free. A New Novelty.


The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS OHIO
BUILT RIGHT RUN RIGHT

The American-Haigh Continuous Kiln

We have now scores of these kilns in operation; in fact, three million brick per day are being burned in Haigh Kilns. We cannot here give you a full list, but mention five of them. The saving on kilns at present is 50 per cent of the fuel and half the burning labor.

Kilns in successful operation at the following plants:

Peebles Paving Block Co., Portsmouth, Ohio.
Albion Brick Co., Albion, Ill.
Iola Brick Co., Iola, Kan.
The Hope Brick Works, Hope, Ark.
The Conard Hallwood Brick Co., Columbus, Ohio.

Sales for October:

The Lehigh Brick Co., Allentown, Pa.
The Wagner Fire Brick Co., Scranton, Pa.

Write us concerning your burning troubles. Our Kiln Department is at your service.

The American Clay Machinery Co.
Bucyrus, Ohio.

Largest Manufacturers of Clayworking Machinery in the World.

We Build Every Appliance and Machine Needed by Clayworkers.

The AMERICAN CLAY MACHINERY COMPANY
BUCYRUS, OHIO
The Haigh Continuous Kiln

BUILT RIGHT RUN RIGHT

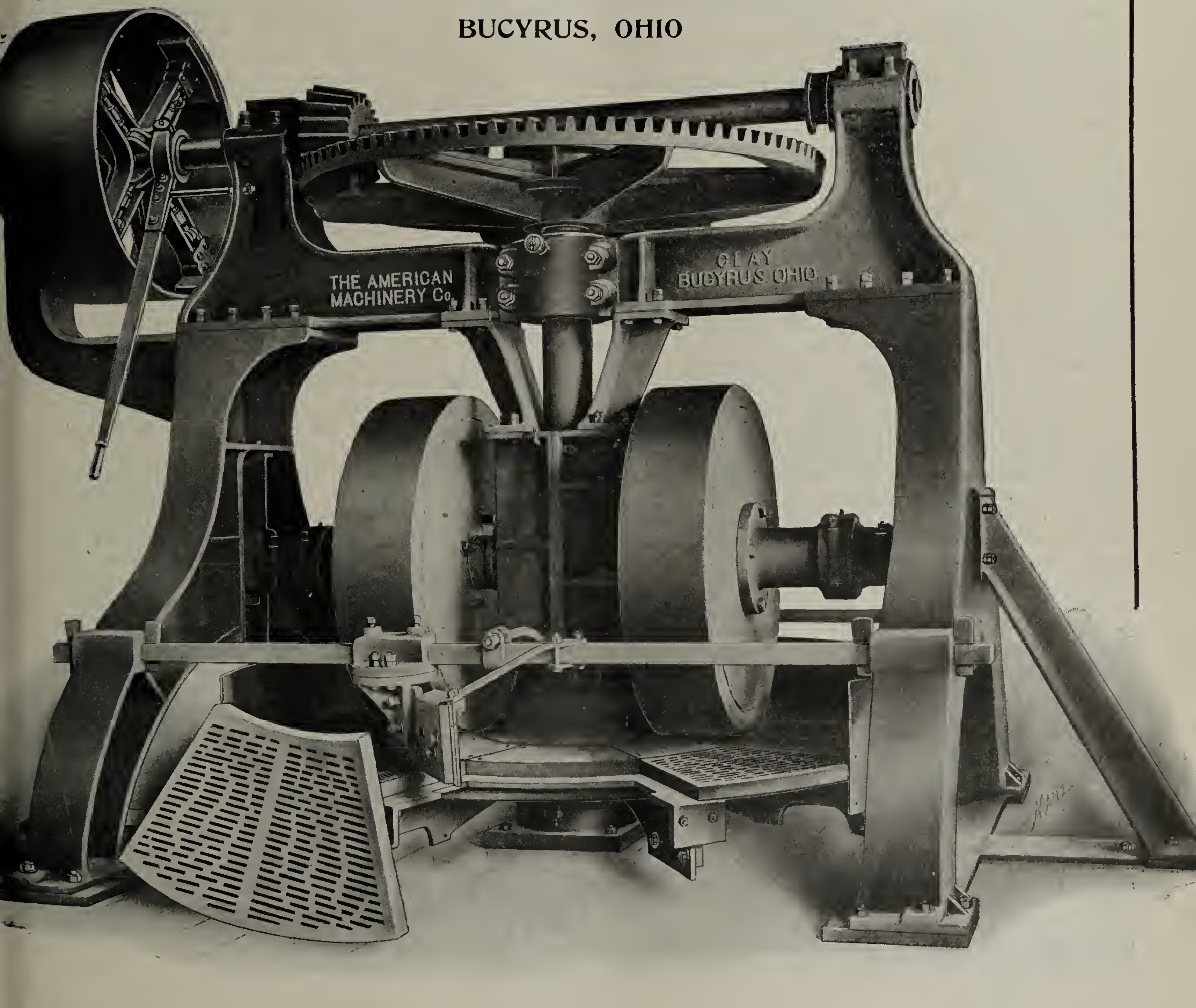
The American No. 57 Heavy Duty Dry Pan

Large, Heavy Mullers and Ample Screening Surface, together with stability of design and construction determine the annual grinding capacity of a dry pan.

The American No. 57 Heavy Duty Pan has all these essentials, which gives the No. 57 Pan a capacity equal to almost twice that of ordinary pans. Built in quality; also cuts out repairs and delays.

The American Clay Machinery Co.

BUCYRUS, OHIO



DYNAMITE IS MORE USEFUL THAN ORNAMENTAL.

DYNAMITE can now be called the farmer's extra hired man. There was a time when farmers were distinctly distrustful of this kind of hired man, but after fuller acquaintance the progressive ones put him on their pay roll. Road builders have also found that dynamite is an exceedingly efficient assistant, one that doesn't lay off after every pay day, one that doesn't get drunk and one that doesn't lose "his" temper except after great provocation.

The farmer, at first, was willing to admit that dynamite might be useful for removing boulders and stumps, and later allowed that it could dig ditches, plow ground, dig holes for planting trees, drain swampy spots and break up impermeable sub-soil. Having dynamite around for these purposes, he found it was useful in a number of other ways, and there are many farmers today, who will not admit that dynamite has any limits to its sphere of usefulness around the farm.

Road builders also have known for years that it is necessary for making rock cuts and blasting rock ledges for crushers, but many of them today do not consider it worth while to have any dynamite around, unless they are working in solid rock. However, it is the purpose of this article to point out a few other places where dynamite may be used to advantage by road builders.

In going through a cut in light soil it helps in loosening up the dirt if charges of a half cartridge of 20 per cent. Red Cross are fired in holes to the required depth, five or six feet apart, each way. Then the scrapers can handle it with ease, doing away with a great amount of hand picking and shoveling. In a hard clay soil, charges of one to two cartridges of 20 per cent. dynamite may be used in holes four to six feet deep, and spaced about six feet apart, and will be found satisfactory for loosening the soil for the scrapers.

Out-crops of rock are frequently met with in road construction, and, of course, require to be drilled either by hand or machine drill for the economical use of explosives. Where it is not possible to drill these out-crops, they may sometimes be mudcapped, but this takes several times as much dynamite to do the work under most favorable conditions as compared with that required in a drill hole, and, frequently, is absolutely impractical. Boulders may sometimes be blasted by firing charges in holes driven beneath them with a bar, or they may be drilled and fired, or, if very hard and brittle, it is most economical to mudcap them.

Stumps may be taken out economically and quickly by firing charges of dynamite under them, placed far enough below the surface of the ground so that the crater produced will include the greatest proportion of the roots. Put the charge in the earth under the stump, rather than in the wood itself, except that the stumps having large tap roots, the explosive should be placed either directly in the tap root or on either side of it and about two feet beneath the surface of the ground. Do not try to mudcap the stump, or to get the explosive down into the center of a rotten stump. This splits and spreads it apart; but makes the final extraction of the roots a difficult problem.

Ditching is frequently necessary and may be done in two ways, depending on the character of the soil. In a dry, sandy soil, single cartridges, 1¼x8 inches of dynamite are placed in holes two to three feet apart and two to two and one-half feet deep, with an electric blasting cap in each hole and the entire line connected up in a series and fired with a blasting machine. In very wet, heavy soil or swampy muck, the ditch may be made by firing charges of one cartridge of 50 per cent. straight dynamite in each hole spaced eighteen inches apart and two to two and one-half feet deep. In this case, it is not necessary to use an electric blasting cap for each hole. One extra cartridge placed in a hole near the center of the line of holes and fired by either an electric blasting cap or a blasting cap will detonate the entire line by influence. Ditches have been dug over a thousand feet long by this method. A hand dug ditch usually costs just about twice as much as a dynamited ditch.

Sink holes, mud holes, bog and mirey spots in low lying portions of country roads are often effectually and permanently drained by firing charges of dynamite in holes driven into the impervious stratum of soil, usually clay or hard-pan, which forms the basin and prevents the water from running down into the earth. These charges should be fired fifteen or twenty feet apart each way, the depth depending upon the nature of the soil. Wet spots in roads have been permanently cured at very little expense by this method.

Dynamite is one of the handiest and most reliable helps the road builder can have in his equipment. It can be used for felling trees, making post holes for fences or planting trees, and for digging and loosening up the soil for telegraph and telephone pole holes.

Road builders as yet have not exhausted the possibilities of its usefulness, but those who have carried it in stock and used it intelligently, would no more dispense with it in any operation than they would with their equipment of picks and shovels.

AMERICAN ROAD BUILDERS' ASSOCIATION.

THE ANNUAL MEETING of the American Road Builders' Association was held on Friday, November 3, at the Automobile Club of America, New York, N. Y., and was preceded by a meeting of the board of directors. The meeting was called to order by Col. E. A. Stevens, State Commissioner of Public Roads of New Jersey, president of the Association.

Reports read by the secretary, E. L. Powers, showed the organization to be in a flourishing condition. The report of the executive committee outlined plans for the annual convention of the Association, which will be held in Boston, Mass., during the week beginning February 5, 1917. The eighth National Good Roads Show will be held in conjunction with the convention, and, according to the committee's report, promises to be the most successful affair of its kind ever undertaken by the Association.

The meeting was followed by the annual "get-together" dinner of the organization, which was held in the grill room of the Automobile Club of America and was attended by upward of one hundred members and guests. The result of the ballot for officers, which had been conducted by mail, was announced at the dinner as follows:

President, Arthur W. Dean, chief engineer Massachusetts State Highway Commission; first vice-president, William H. Connell, chief Bureau of Highways and Street Cleaning, Philadelphia, Pa.; second vice-president, Austin B. Fletcher, State Highway Engineer of California; third vice-president, Arthur H. Blanchard, professor of highway engineering, Columbia University, New York; secretary, E. L. Powers, editor of "Good Roads"; treasurer, W. W. Crosby, consulting engineer, Baltimore, Md.; directors for three years, T. R. Agg, professor of highway engineering, Iowa State College, Ames, Ia.; W. E. Atkinson, State Highway Engineer of Louisiana; Fred E. Ellis, manager Essex Trap Rock and Construction Company, Peabody, Mass.; R. H. Gillespie, chief engineer of sewers and highways, Borough of the Bronx, New York City; B. Michaud, deputy minister, Department of Roads, Province of Quebec, Canada; Paul D. Sargent, chief engineer Maine State Highway Commission.

Papa's Hair Cut.

A woman said to a little boy with his hair bobbed in his neck: "Franklin, when are you going to have your hair cut like papa's?"

"I don't want my hair cut like papa's," he replied, "with a hole in the top."—The Christian Herald.

100% INCREASE IN BRICK HOME CONSTRUCTION

Effect. This is the record made in Cleveland in 1916, according to figures from the City Building Department. It is double the amount of money expended for brick homes in any preceding year.

Cause. The First National Complete Building Show was held in Cleveland in February. There the brick manufacturers of the Middle West made the finest display of Face Brick ever erected. Educational literature was sent to more than 6,000 prospective home builders who visited the brick exhibit.

Opportunity. **The Second**
National Complete Building Exposition
Grand Central Palace, New York
March 5, 6, 7, 8, 9, 10, 11, 1917
offers an even greater opportunity for presenting brick and increasing its use with home builders. The New York show will be national in scope, attracting the builders, architects and engineers from all parts of the country.

A Bigger and Better Show
In Every Department
The Most Beautiful Exposition Building in the World
Within a Trolley Ride of 7,000,000 People.

CONVENTIONS DURING THE SHOW:

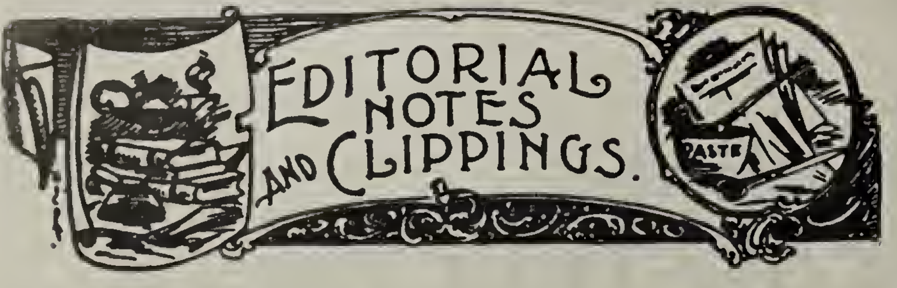
The National Brick Manufacturers' Association,
The National Paving Brick Manufacturers' Association,
The American Ceramic Society,
and many others.

Manufacturers should not delay in making reservations for exhibition space. It is selling rapidly. Address:

The National Complete Building Exposition

Eastern Office:
Grand Central Palace,
New York.

Western Office:
Leader-News Bldg.,
Cleveland.



The A. P. Green Fire Brick Company is making extensive improvements in its plant at Mexico, Mo.

The Hoytsville Tile Manufacturing Company's plant, at Findlay, Ohio, which was recently destroyed by fire, will be rebuilt.

Wm. House, an employe of the Portsmouth Refractories Company, was instantly killed when caught beneath a fall of clay at the plant, at Firebrick, Ohio.

E. F. Plumb, of Streator, Ill., has been granted a patent on a machine for making a rough face brick, and has assigned the patent to the Streator Brick Company.

The Cannelton Clay Products Company, of Cannelton, Ind., has been incorporated, with $20,000 capital stock, by Martin F. Gasper, Henry Heck and Thomas W. Irvin.

The Builders Co-operative Brick & Tile Company, of Nazareth, Pa., has been incorporated with $15,000 capital stock. Harry J. Osterstock, of Easton, Pa., is treasurer.

The Meteor Brick Company, of Johnstown, Pa., has been incorporated with $10,000 capital stock. The incorporators are C. J. Burkhard, M. Berney, H. Silverstein and others, of Johnstown, Pa.

The Huntington Clay Products Co., of Huntington, W. Va., has been organized to erect a plant at Barboursville, that state, with 100,000 daily capacity. The head office of the company will be located at Huntington.

John Peters, general manager of the Petersburg (Ohio) Fire Brick and Tile Co., has announced that his company will soon begin the erection of two large brick kilns at their plant in Coal Grove, Ohio. He has just closed an order for 700,000 brick to be sent to Chicago.

Incorporation papers have been filed by the Ancho Brick Company, of Ancho, Lincoln county, N. Mex., the capitalization being $450,000. The incorporators and directors are: J. E. Morgan and John Franklin, of El Paso; O. V. Rye and S. W. French, of Douglas; M. Earle, Des Moines, Iowa; S. Heyfield, Ancho, and T. H. O'Brien, Dawson.

Owing to the high price of coal, the brick plant at Junction City, Ohio, which is operated by the state with prison labor, has been closed down. Some extensive improvements and repairs are to be made to the plant during the shutdown, and the eighty-one prisoners who have been employed in the manufacture of brick will be retained for that work by Superintendent Chilcote.

John E. Landrum, one of the pioneer clayworkers of Ohio, died November 1 in his seventy-fourth year. He was active in the business until the last ,being president of the Columbus Clay Manufacturing Company at Taylor Station and the Rush Creek Clay Company at Junction City. He is survived by four daughters and six sons, four of whom, Edward, Harry and Paul, were associated with him in the business.

R. J. Goodwin is at the head of the Knoxville Clay Product Company, Knoxville, Iowa, which has been incorporated with $200,000 capital stock, and work on an immense new plant will be started at once. Mr. Goodwin has had many years' experience in brickmaking, his latest work being the installation and operation of the brick plant at the State Hospital for Inebriates, by which he built up one of the most profitable industries for the state of Iowa. The officers of the new concern are Robert J. Goodwin, president; Earl Foft, vice-president; W. J. Goodwin, of Des Moines, secretary and treasurer, and S. L. Davidson, general manager.

As the result of a voluntary move by the United States Potters' Association, 7,000 pottery workers in the United States and Canada who are members of the National Brotherhood of Operative Potters were granted wage increases varying from 5 to 10 per cent. November 15. Workers in plants in East Liverpool, Wellsville, Salem, East Palestine, Steubenville, Carrollton, Crooksville, Ohio; Newell, Chester, Wheeling, Clarksburg, Huntington, Mannington and Grafton, W. Va.; New Castle, Canonsburg and Beaver Falls, Pa.; Kokomo and Evansville, Ind.; Trenton, N. J., and St. Johns, Canada, are affected by the decision. Unprecedented prosperity in the pottery business this year is said to be responsible for the move.

The Victor Brick Company has been incorporated with $130,000, at Philadelphia, Pa., to manufacture brick and other clay products.

The Penland City Company, of Penland, N. C., has been incorporated, with $50,000 capital stock, to develop the kaolin deposits of the state.

The Western Brick Co., of Danville, Ill., recently booked a contract for 150,000 buff brick for the new Y. M. C. A. building at Anderson, Ind.

The Barkwill-Farr Brick Company, of Cleveland, Ohio, has purchased a large tract of land near Cleveland on which they will erect an additional brick plant.

The Decatur Brick Manufacturing Co., of Decatur, Ill., recently shipped twelve car loads of brick to Winnipeg, Can. The freight charges of the brick amounted to $12.70 per thousand.

Enterprise Pottery Company, Trenton, N. J., a subsidiary of the Trenton Potteries Company, manufacturers of sanitary earthenware, will build a new plant to cost $27,000. Burton & Burton, Trenton, have been awarded the contract.

George Taylor, an employe of the Medora (Ind.) Shale Brick Co., was very seriously injured when he fell into the shale crusher. Both of his legs were so badly mangled that for a time it was feared amputation would be necessary.

The plant of the Illinois Brick Company, at Grant Park, Ill., was damaged by fire to the extent of $40,000 the latter part of October, which started from an overheated kiln. O. E. Cook, manager of the plant, is now busy rebuilding the burned portion.

The Fulton Fire Brick Company, of Fulton, Mo., recently received an inquiry for prices of fire brick for Lima, Peru, South America, for fire box linings. The company sends brick to almost every part of the United States, but the inquiry from Lima is a little unusual.

Claude J. Webb, Robert F. Bankert, Jr., and Karl W. Collins, of Altoona, Pa., have organized the Interlocking Key Brick and Block Co., with headquarters at Altoona. The company, which has been capitalized at $100,000, will manufacture paving, building and fire brick.

One of the largest contracts for face brick deliveries made in New Orleans in recent years was closed recently by the Salmen Brick and Lumber Company, of Slidell, La., when it won the bid for the 300,000 face brick for the new ten-story Cumberland Telephone Company building in Poydras street. The contract also included orders for 1,000,000 building brick, all of which were manufactured at the Slidell plant of the Salmen company.

The Oconee Brick & Tile Company, of Milledgeville, Ga., report a very busy season. Its products, which include almost everything in the way of fire-proofing tile and cupola blocks, furnace door linings, locomotive tile, wall copings, vitrified sewer pipe, drain tile and fire brick, have been shipped all over the South, as far west as Texas and as far south as Cuba. J. H. Bone is president; J. L. Stevens, vice-president, and Frank Bone, secretary and treasurer of the company.

Two additional licensees have been added to the family of the Dunn Wire-Cut Lug Brick Company, of Conneaut, Ohio. These are the Streator Clay Manufacturing Company, Streator, Ill., which has recently completed a new plant with a daily capacity of 60,000 paving block; R. H. Green, president; James A. Green, vice-president, and John Connelly, secretary; also the Martinsville Brick Company, of Martinsville, Ind., with a daily productive capacity of 30,000; E. J. Poston, president; B. C. Poston, vice-president; O. E. Sweet, secretary.

The Jamestown Shale Paving Brick Company, of Jamestown, N. Y., has become a licensee of the Dunn Wire-Cut Lug Brick Company, of Conneaut, Ohio, and will make wire-cut lug paving brick. This company has been making paving brick for more than thirty years and has rebuilt its plants so they are modern, up-to-date and fireproof. It has a daily capacity of 65,000 blocks. It operates five rectangular kilns with a daily capacity of 25,000 and a continuous kiln with daily capacity of 40,000. The company has seventy-five acres of workable shale bed from 75 to 100 feet within the city limits of Jamestown. The officers of the company are: A. N. Broadhead, president; Thomas Mahoney, vice-presi-

(Continued on page 470.)

Rockingham Road, Davenport, Iowa. Brick pavement filled with Barrett's Paving Pitch.

Barrett's PAVING PITCH

Smooth pavement with a grooved footing

THE ideal combination of a smooth pavement with a grooved footing is attained by a brick pavement with the joints filled with Barrett's Paving Pitch. The pitch in the joints makes them act like grooves. These grooves are too small to be the cause of any noise from wheels. Likewise they are too small to interfere with the smooth and easy traction which the pavement offers.

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TRADE B MARK

EDITORIAL NOTES AND CLIPPINGS—Continued.

dent; John Mahoney, treasurer; J. B. Fisher, secretary; R. F. Fisher, manager; A. B. Green, superintendent.

The Paducah Clay Products Company, of Paducah, Ky., has filed a certificate decreasing its capital stock from $250,000 to $30,000.

The American Face Brick Company, of Cleveland, Ohio, has been organized by John Harms, Alvo L. Bishop and others. The company is capitalized at $10,000.

The Lima Hollow Brick Co., of Lima, Ohio, has been incorporated with $150,000, and will take over the plant of the National Roofing Tile Company at Lima, or erect a new plant.

The Stevens Point Brick Manufacturing & Construction Company, of Stevens Point, Wis., contemplate changing from the old open-air method of drying to a steam dryer, and would like to buy a second-hand dryer equipment.

Announcement has been made of another important Cleveland merger, whereby the Cleveland Brick Sales Co. and the Lake Erie Builders' Supply Co. have been consolidated and will be operated under the name of the latter concern.

A number of important improvements are being made to the plants of the Harbison-Walker Refractories Company, located at Woodland, Pa. The work is under the supervision of D. E. Young, superintendent in charge of the two plants.

The new plant of the Tuttle Building Material Company, Riverdale, Chicago, Ill., was completed about the middle of last month, and is now in full operation, turning out 200,000 brick per day, and this will be increased later as the demand necessitates.

The plant of the Medal Paving Block Co., located at Wooster, Ohio, was compelled to close down early in November on account of the difficulty in obtaining a sufficient supply of coal. Some needed repairs will be made in the plant while the factory is closed down.

The Virginia Potteries Company is a new corporation recently incorporated to erect a plant at New Lexington, Ohio, for the manufacture of all classes of porcelain, including high tension insulators and other electrical supplies, and also fire-proof cooking ware. The company is capitalized at $300,000. Those interested are L. E. Holdeman, of New Lexington; W. E. Abbott, H. Frankenberger, L. E. Poteet and F. S. Rodes, of Charleston, W. Va. The head office of the company will be at Charleston.

The Pine Bluff Brick Company's plant, on the Iron Mountain railroad, four miles west of Pine Bluff, Ark., has been sold to the Arkansas Brick and Tile Company, of Little Rock, for $27,500. The Pine Bluff plant will be one of a chain of plants owned and operated by the Arkansas Brick and Tile Company. Garland Brewster will be sales manager for the local plant. Operation of the plant will be in charge of Alphonse Brewster, Jr., and J. W. O'Neal, who held the same positions under the old management.

While handling a revolver, which an employe had left at the office, Henry Nesch, president of the Nesch Brick Company, at Pittsburg, Kansas, was shot in the abdomen, and died shortly after. His brother, Robert Nesch, and several others were in the office at the time, and the wounded man was rushed to the hospital, where an operation was performed without avail. Mr. Nesch was forty-two years old, and became president of the company at the death of his father, a few years ago.

The Clay Products Company, with headquarters in the Lemcke Annex, Indianapolis, is making good headway with immense new paving brick plant at Brazil, which it will operate in conjunction with its other large plant there. The materials for the new plant are all on the ground and they expect to begin construction work immediately after the opening of the new year. The chief product of the company's plant at Brazil which is now in operation is the Denison interlocking tile for the Central States. The company also operates a large plant at Abingdon, Ill.

The Anderson Foundry & Machine Works, of Anderson, Ind., report business as very good. They have just finished two big presses for The General Insulating Company, at Alexandria, Ind., and during the last month shipped one press to the American Refractories Company, at Danville, Ill., and one to the Mosaic Tile Company, at Zanesville, Ohio. In addition to this, they just finished a big engine for the Oklahoma College and have shipped the second engine this year to Lima, Peru, and General Manager W. N. Durbin is feeling pretty good over an order from the Royal Italian Navy for three of their largest oil engines.

W. J. Kenderdine, Ashby Wygal, J. J. Mott and R. L. Jenkins have organized a company which will erect a brick manufacturing plant at Radford, Va.

Edward Powers and S. Powers, of Hamby, Texas, have purchased the Abilene (Texas) Press Brick Company from the Guaranty Trust Company of Abilene.

Ruben Spargur was killed instantly at the Polenske-Schellak Brick Company's plant at Hastings, Neb., while repairing some machinery. In some way the machinery was started and he was crushed to death.

B. L. Priddie, secretary of the Marble Products Company, of Huntington, W. Va., writes that his company is investigating the manufacture of brick and tile from shale, as they contemplate erecting a plant at or near Huntington for the manufacture of building brick and tile.

The plant of the Goldsboro (N. C.) Brick Company, which is owned by H. L. Grant & Son, was totally destroyed by fire November 7. The fire originated in the boiler room and spread so rapidly that nothing was saved but the horses and mules. The loss is estimated at $10,000.

James R. Ryan, member of the firm of the Rick-Ryan Brick Company, of Harrisburg, Pa., and one of the most active business men of that vicinity, has entered the retail field there through having recently purchased the business of the Imperial Hardware Company. Mr. Ryan has announced that he will continue his connection with the Rick-Ryan Brick Company, despite early rumors to the contrary.

Work has been completed upon the arrangement of a clay building materials exhibition at the offices of Samuel B. Dobbs, 304 Bailey building, Philadelphia, by reason of which the Dobbs' offices have taken on the appearance of a brick and similar clay product art gallery. In addition to the transformation of the offices in this style, additional office and show room space has been taken by the firm to enable the handling to better advantage the increasing volume of business it is experiencing.

Walk Ahead.

If yer want ter get ter somewheres,
Walk ahead!
Don' yer loiter by the roadside
Playin' dead.
Walk, an' whistle when yer walkin';
Smile, an' do some friendly talkin',
An' you'll get there without balkin'!
It's been said
That a tortoise, fat an' funny,
Beat a real swift-movin' bunny,
When they raced ter win some money;
An' I read
That he did it, cause he follered,
While the bunny slep' an' wollered
In the roadside. Fer the tortoise
Walked ahead!

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RESULTS: A quick, even burn. Frequently one-half of the fuel formerly required —SAVED. Lowered Burning Costs. Increased Kiln Capacity (due to turning more often). A Happy Clayworker. In addition, this system is easy and inexpensive to install and pays big interest on the investment.

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Corner Spring and High Streets
Commerce Bldg., Columbus, Ohio
Kiln Bands, Grate Bars and All Accessories.

PROPERTIES OF SOME EUROPEAN PLASTIC FIRE CLAYS.

(Continued from page 429.)

0.01 mm. Undoubtedly this represents the most important separation, as it includes all of the clay substances. It would be erroneous, however, to consider this fraction as consisting only of clay substance, as undoubtedly fine quartz and feldspar are invariably present. The remaining material must be considered granular in character since it is lacking in real plasticity. The other separations advocated by Seger are silt, 0.025 to 0.01 mm; current velocity 0.7 mm per second; dust sand, 0.04 to 0.025 mm, 1.5 mm. per second; fine sand, 0.333 to 0.040 mm, and coarse sand larger than 4.333 mm. The Schoene elutriating apparatus is probably the best known of the devices proposed for this purpose. It consists of a glass cylinder, provided with a piezometer, and is supplied with water from a container, under a constant head. This simple device can be made to do good work provided the temperature of the water is kept as constant as possible and either rain or distilled water is used in its operation. It is desirable also to deflocculate the clay sample at the beginning of the run with caustic soda or to maintain a small alkali content in the wash water.

Another elutriating apparatus sometimes used for this purpose is that proposed by Schulze. Here the flow of water is kept constant and the several desired velocities are obtained by using three or four increasingly large cylinders. The material is placed first in the smallest can, in which the highest velocity is maintained, and is then carried into the larger ones. Since the velocity is constant in each can a definite fraction will be thrown down in the conical bottom of each. The comparatively large areas of the separating cans and the size of the latter cause certain irregularities in operation and hence variable results, which, however, can be partly neutralized by the use of larger samples of material. The Schulze apparatus is easier to operate than the Schoene and is more suitable for industrial control where approximate results suffice.

4. Composition.

The chemical and with it the mineral composition of the plastic fire clays under consideration is obviously of fundamental importance; but it is influenced and modified so largely by physical conditions that as a guide in the selection of suitable clays it is of secondary service. This is illustrated by the fact that we have in the United States a large number of clays practically identical or closely approaching the chemical composition of the best-known European bond clays but which fail completely in satisfying the requirements. We are compelled, therefore, to assign to chemical composition a secondary value. This does not mean, of course, that the composition is to be entirely neglected. It must always correspond to that of refractory clays. Any excess of fluxes would evidently render the material valueless, since refractoriness is one of the conditions to be met. The fact to be realized is that it fails to differentiate between the several types of fire clays, all of which are sufficiently refractory for the purpose.

In studying the clays of this type a knowledge of the chemical composition is always desirable, as is the case with all refractory clays. Further light may often be thrown upon the behavior of such clays by supplementing the ultimate analysis by the so-called rational or mineral analysis. This method, proposed by Forchhammer and Fresenius and amplified by Bischof, Richters, Seger and others, depends upon the fact that clay substance and mica are soluble in boiling sulphuric acid, while quartz and feldspar are not. By treating the clay with hot concentrated sulphuric acid, diluting, filtering, washing with sodium carbonate, and finally with dilute acid solutions the clay substance plus mica may be removed from the

(Continued on page 475.)

LET US SHOW YOU

Experience is a dear teacher. ✤ He is wise in his day and generation who profits by experience. ✤ Especially the experience of others, and thereby avoids failure and achieves success. ✤ We speak from experience and with practical knowledge, as our record proves. ✤ We are "From Missouri" and can SHOW YOU improved methods of making and burning brick and other clayware.

Our experience enables us to tell beforehand whether a certain kiln will do the work it's going to be built for. This very experience most of our competitors are lacking, which fact explains the large number of failures.

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Engineers and Experts to the Manufacturers of Clay Products
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The Face Brick Dealers' Association Will be Held
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PROPERTIES OF SOME EUROPEAN PLASTIC FIRE CLAYS.

(Continued from page 472.)

clay. The residue composed of quartz and feldspar may then be partially analyzed by determining the silica and alumina or the alkalies and the content of the two mineral constituents computed. This method is not scientifically exact and fails completely for the low-grade clays but, nevertheless, it is capable of giving useful results.

The presence of carbonaceous constituents in clays seems to contribute toward rendering them more plastic. It would seem, therefore, that a knowledge of the carbon content of such clays would be of service in explaining the behavior of these materials, since it is evident that the organic matter is an important element in developing the desirable quality of high plasticity.

5. Drying Shrinkage and Drying Behavior.

The strong plastic clays of the type under discussion show considerable contraction in volume upon drying. At the same time there is a distinct tendency on the part of some clays, such as the well-known Klingenberg material, to air check. Both of these items deserve attention. The difficulty due to air cracking is, of course, largely overcome in actual use by the employment of a large proportion of non-plastic material in the form of calcined clay, crushed potsherds (grog) and graphite. The drying shrinkage is determined by accurately calipering between shrinkage marks made on a bar of the clay in the plastic state and comparing the lengths in the wet and dried state. The shrinkage is usually expressed in per cent. of the original or of the dry length. More accurate results are obtained by the use of the voluminometer, in which the volume of contraction is determined. The measuring liquid commonly employed is kerosene. The measurement of the volume shrinkage is the only accurate method for determining this constant, since the linear contraction is not uniform in all directions but within certain limits is dependent upon the geometrical proportions of the test specimen. The shrinkage is also a function of the rate of drying, which is governed by the temperature (humidity) and the velocity of flow of the air around the piece being dried. As a rule the shrinkage is found to be smaller where the drying proceeds rapidly and larger where the process is taking place more slowly.

The behavior of a clay in drying can be estimated in a satisfactory way only by means of practical trials where the material is made up into larger pieces both with and without admixture of the nonplastic, inert constituents. Small laboratory trials usually are apt to deceive as to the real behavior of the clay.

6. Effect of Heat.

Plastic fire clays may be roughly divided into two classes, namely, open and dense burning materials. The former when fired to high kiln temperatures, say, corresponding to pyrometric cones 14 to 16, retain their open structure, owing to the small amounts of fluxes, iron oxide, lime, magnesia, and the alkalies. The second type burns to a dense mass at these temperatures or below and may even show overburning or the formation of a vesicular, spongelike structure. Both types of clay are necessary. The first type is inherently more refractory and is able to withstand load conditions at furnace temperatures more satisfactorily. The second type is useful in closing up the pores of the material and producing a dense mass resistant to the corrosive action of slags and glasses. The ideal condition would be obtained by the use of a mixture of the two classes of clays and restricting the amount of the dense burning material to the minimum necessary to bring about the desired density. It is to be expected, of course, that there are to be found gradations between the two extremes, inasmuch as certain clays have some of the attributes of both classes.

The study of the rate of condensation or vitrification, a term not to be confused with the idea of glassiness, is usually

(Continued on page 476.)

"We have been using the Gandy Belt in connection with our plant for some time, and it has given us very good results. We believe it is less affected by the dust of a cement mill than any other class of belts."

DUST is one of the worst enemies that a good belt encounters in its daily duties.

When it gets between the pulley and belt, it becomes grit, and with the continued pull and traction takes its toll by shortening the life and service of the belt.

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gives a flexibility of layout, to secure cleanliness, best lighting conditions—ease and convenience of operations of the various machines.

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Sales offices in all large American cities.

PROPERTIES OF SOME EUROPEAN PLASTIC FIRE CLAYS.

(Continued from page 475.)

followed by determining the decreasing absorption of water or porosity at a series of increasing temperatures. For this purpose specimens of the clay are made up in the shape of cubes or bars, which are fired in a kiln of sufficient size at a rate of temperature increase of about 20° C per hour. At intervals of 20° or 40° a specimen is withdrawn from the kiln and cooled slowly in hot sand or in a small furnace kept at a red heat. Upon determining the absorption or the porosity of the trials and correlating graphically these values with the temperature of withdrawal a diagram is obtained which is characteristic of the burning behavior of the clay. Decreasing porosity must, in the nature of the case, parallel the process of vitrification. The higher the content of fluxes the larger must be the quantity of the matter softening under the influence of the heat so that condensation or minimum porosity is reached at a comparatively low temperature. The open burning clays, on the other hand, show no striking drop in porosity and retain their porous structure at the temperatures involved. This behavior undoubtedly is due to their more refractory character, viz, the low content of fluxes. Such a diagram, first used by Purdy[8] for the study of clays, is extremely valuable in showing comprehensively what is taking place in a clay when being fired, and hence is a very valuable aid in classifying the clays.

It gives evidence not only concerning the vitrification temperature range of the materials but shows also when and to what extent the phenomenon of overburning takes place. By this is meant the formation of vesicular structure due to the evolution of gases. This is evidenced by the fact that during this stage the porosity again increases, since the clay becomes more or less spongelike in character. The usefulness of the clay is seriously lowered even during the incipient formation of this structure, as it is evidence that the clay has softened to a very great extent, and owing to the resumption of the greater porosity becomes more subject to the action of corroding slags or glasses. Fortunately in the presence of fine and coarser grained calcined clay of high refractoriness, grog, the formation of the vesicular structure is opposed by allowing the gases to escape more readily, by the solution of the fine-grained refractory clay with consequent stiffening, and by the mechanical effect of the skeleton of coarser grog particles. This condition is subject to regulation by the sizing of the grog, which makes necessary both the introduction of very fine particles and a series of coarser sizes. The adjustment of the sizes should be such that maximum density is produced in the dried state. It is specially important to keep in mind the function of the fine grog, a fact not as commonly realized as it should be.

A plastic clay which shows some formation of vesicular structure need, therefore, not be condemned on this evidence alone. If, however, it persists in bloating when admixed with grog, its use becomes decidedly questionable.

7. Fusion.

It is well understood by this time that clays do not possess a definite melting point like minerals and metals. Softening takes place during a long-temperature interval. For purposes of comparison it is customary to determine that point at which small tetrahedra of clay soften to such an extent that the cones bend over completely, and we speak of this point, though wrongly, as the fusion or the melting point of the clay. In this connection it is important to note that time is an important factor, which is illustrated by the fact that this arbitrary degree of softening occurs at a lower temperature when the heating is continued for a longer time and vice versa.

(To be continued).

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[8] Illinois Geol. Survey Bull. No. 9, p. 256.

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Dries Easily the Most Tender Clays.
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One 70-h.p. Economic boiler.
One tubular boiler, 3-ft.-6-in.x12-ft.-0-in.
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One 9B Brewer tile machine with dies from 3½ to 18 inches, inclusive. In good condition, practically as good as new. MARTIN BROS.,
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Brick plant situated on the Chesapeake & Ohio R. R. and the Kanawha river; 600 acres of clay suitable for making fire brick, coke oven brick, street pavers, buff, red and flash brick and glaze sewer tile, also pottery clay. Will lease on liberal terms. Apply to
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Position by a man thirty years old, as foreman or head burner on stiff mud or dry press plant with down draft kilns. Have had ten years experience with one of the best plants in the Middle West. Have had a great deal of experience in handling paving brick. Can furnish A No. 1 references. Address
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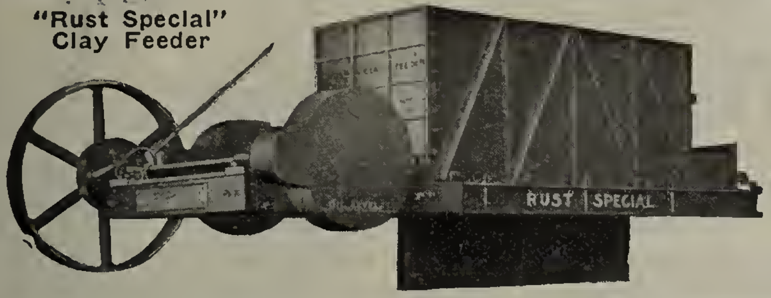

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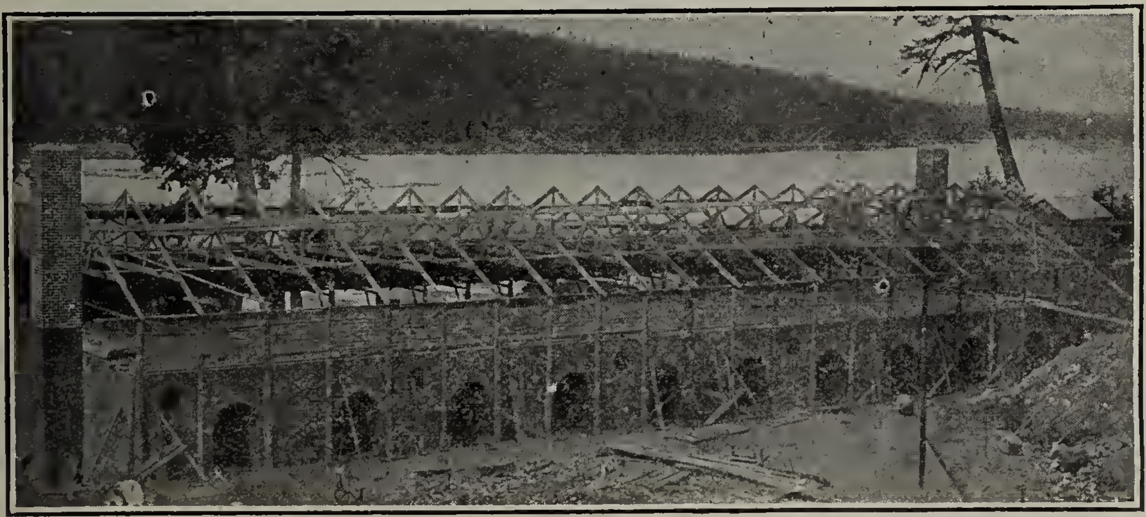

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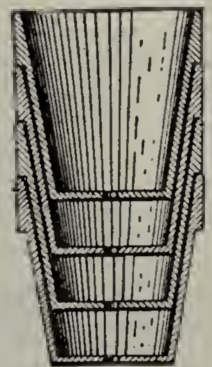

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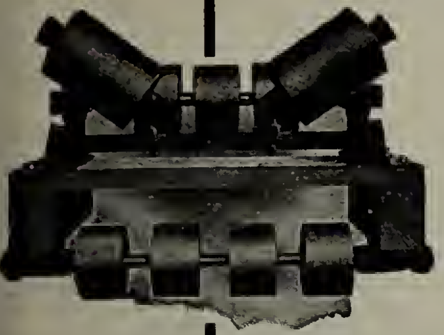

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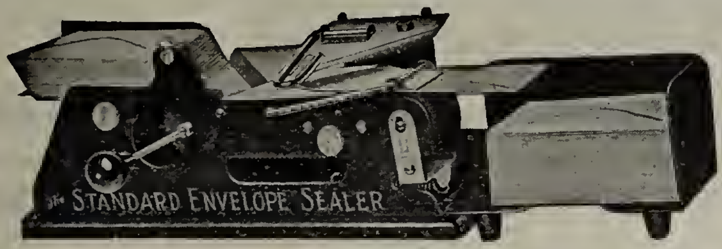

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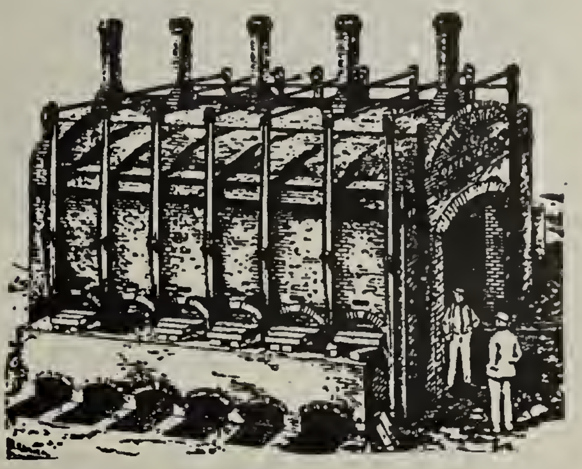

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This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

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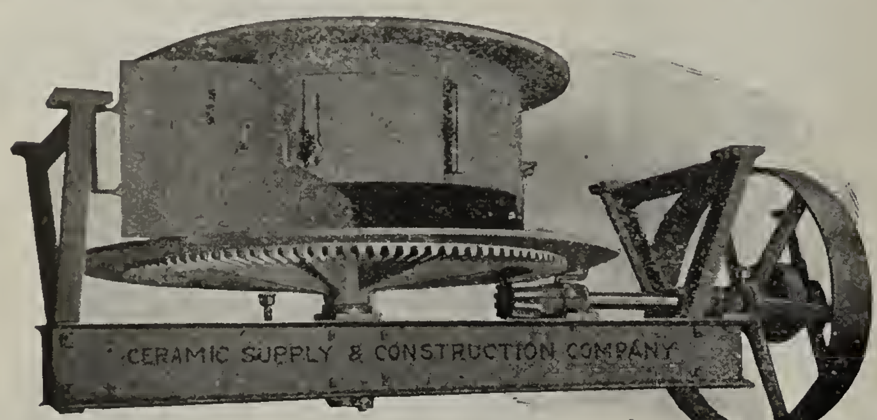

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Uniform increase of temperature and decrease of humidity from receiving to discharge end of dryer. Highest economy of fuel and operation, and lowest installation cost. Does not require track, dryer cars, brick work, fans, stacks, fire-box or flues.

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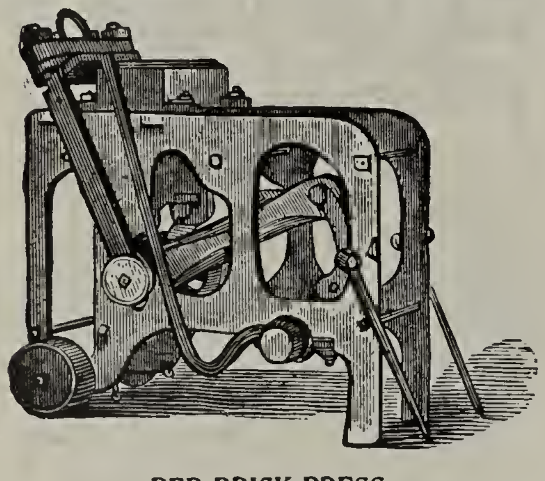
Manufacturer of All Kinds of Machinery Used in the Manufacture of F and Red Brick.



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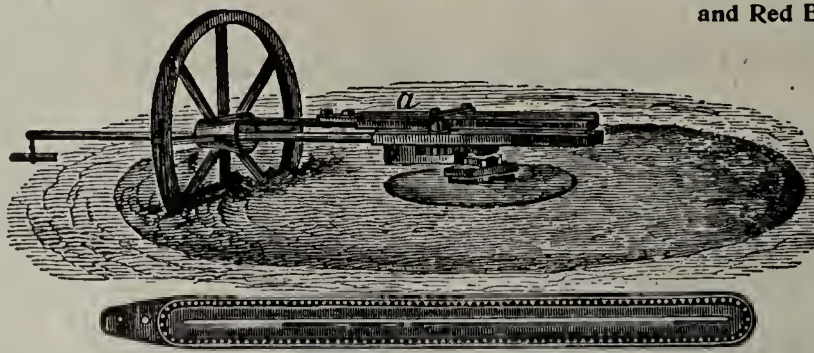

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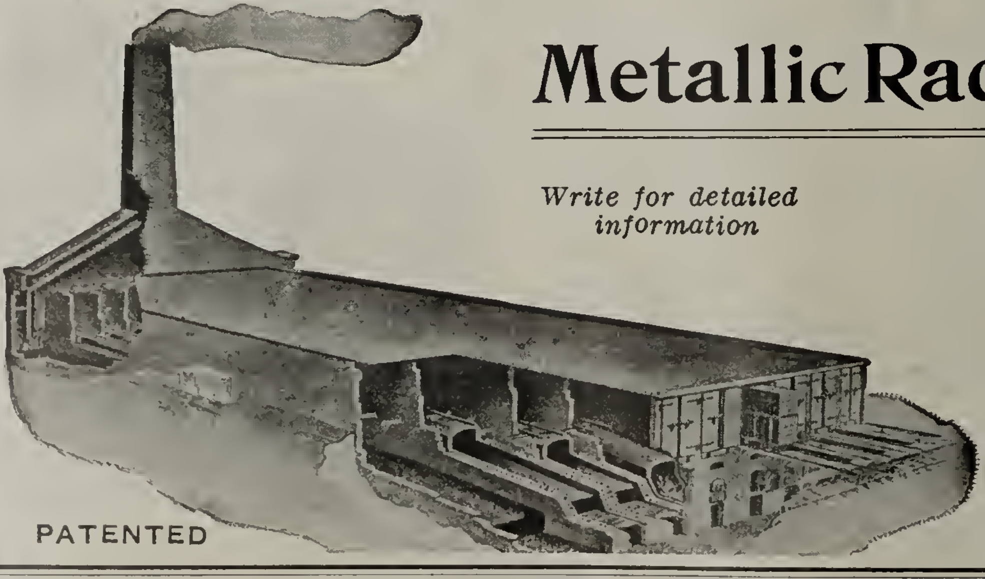

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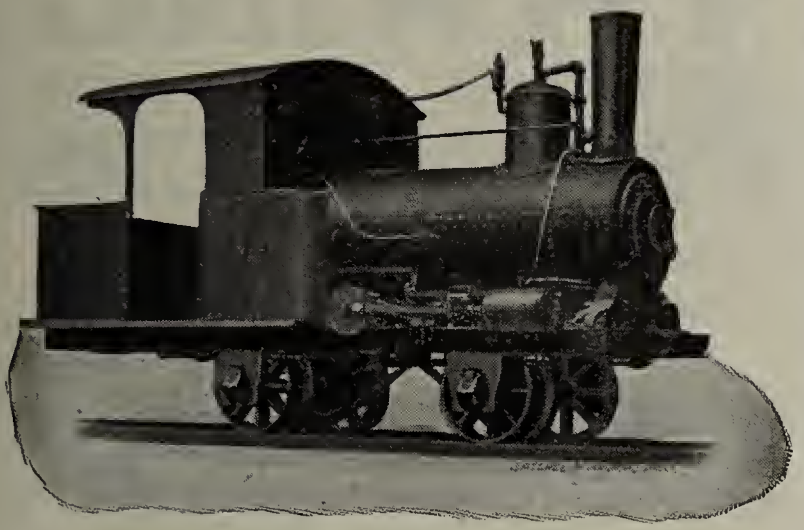

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The last word in economical clay transportation.

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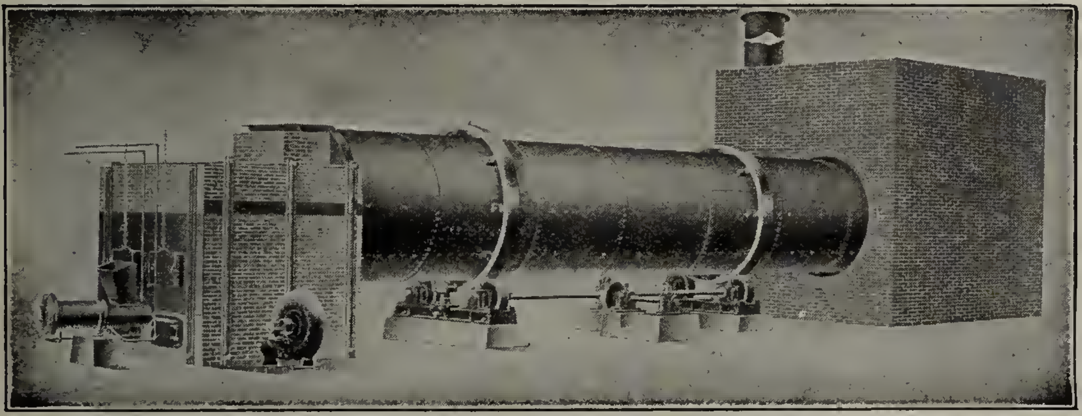

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Indianapolis Indiana

Notice of Removal

Owing to the greatly increasing demand for

THWING
HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

we have been compelled to seek larger quarters for the manufacture of these popular instruments. Address after November 1, 1916,

Lancaster and Cuthbert Sts.
Philadelphia

Better service than ever will thus be insured to our many patrons.

Thwing Instrument Company
Lancaster and Cuthbert Sts
PHILADELPHIA, PA.

ECONOMY True economy is the sure road to wealth today, just as it has ever been. This is generally conceded, but it is not always certain what constitutes true economy. In the clay line it is ofttimes real economy to replace small capacity machinery with larger in order to meet the demands of a rapidly growing trade. Really it is false economy not to do so, for one must spend money to make money. He is wise who recognizes this truth and promptly replaces outgrown machinery with that equal to his needs. Then, after you have done the wise thing in enlarging and refitting your plant, don't let the outgrown machinery go to the scrap pile. It may prove a boon to some manufacturer starting a small capacity plant for which it will be ample. There are many such and they may be reached through an ad in the For Sale columns of The Clay-Worker. Be wise, not wasteful, and instead of letting your outgrown machinery rust out, advertise it in The Clay-Worker (see forms of ads under heading "For Sale, Wanted, Etc.," in this issue) and convert it into ❧ ❧ ❧ ❧ ❧ **CASH**

To insure insertion in current issue, copy should be furnished early in the month.

Address

THE CLAY=WORKER,

Indianapolis.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

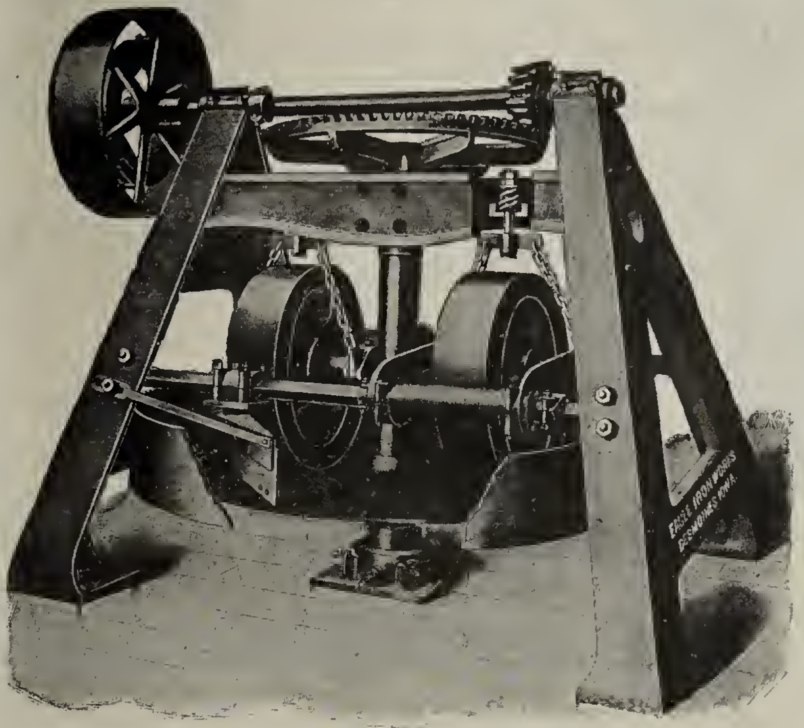
At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

Independent and Suspended Mullers

the distinguishing feature of our **DRY PANS**



Other valuable features which our catalogue fully describes.

EAGLE IRON WORKS
Des Moines, Iowa

1,653,000 Cubic Yards in 24 Years

Clay for 264,000,000 Brick in 9 Years with Type 0 Thew.

Clay for 397,500,000 Brick in 15 Years with Type 3 Thew.

Clay for 31,000,000 Brick in 1916 with Type I Thew and but half a day's delay during the year.

Twenty-four years of service and still operating and the owner writes: "The shovel is not very handsome to look at but it does its work without any trouble. We can't say anything too good for the shovel or for The THEW COMPANY."

Over 300 Brick Manufacturers own THEW SHOVELS and will bear similar testimony.

239 Thew owners have given repeat orders.

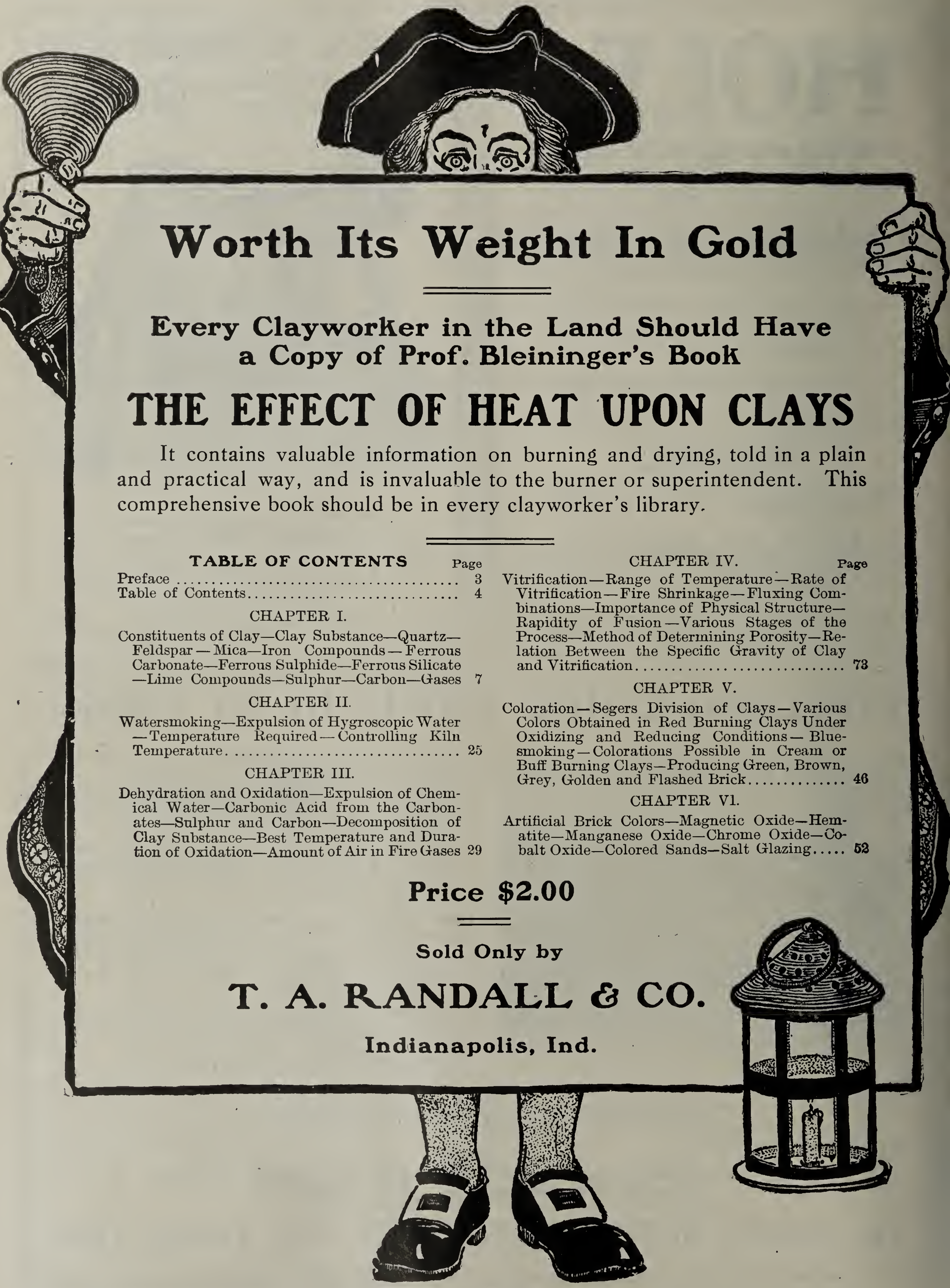
In the face of such testimony, can you afford to employ old methods and have your output reduced by inability to get men enough in the clay pit to keep your plant running to capacity?

A Thew shovel would save you time, money and trouble, increase the output of your plant and improve the quality of your product.

Circular 22-F shows you why and gives valuable data. It is yours for the asking.

INVESTIGATE THE THEW. IT PAYS.

The THEW AUTOMATIC SHOVEL CO., Lorain, Ohio



Worth Its Weight In Gold

Every Clayworker in the Land Should Have a Copy of Prof. Bleininger's Book

THE EFFECT OF HEAT UPON CLAYS

It contains valuable information on burning and drying, told in a plain and practical way, and is invaluable to the burner or superintendent. This comprehensive book should be in every clayworker's library.

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Price $2.00

Sold Only by

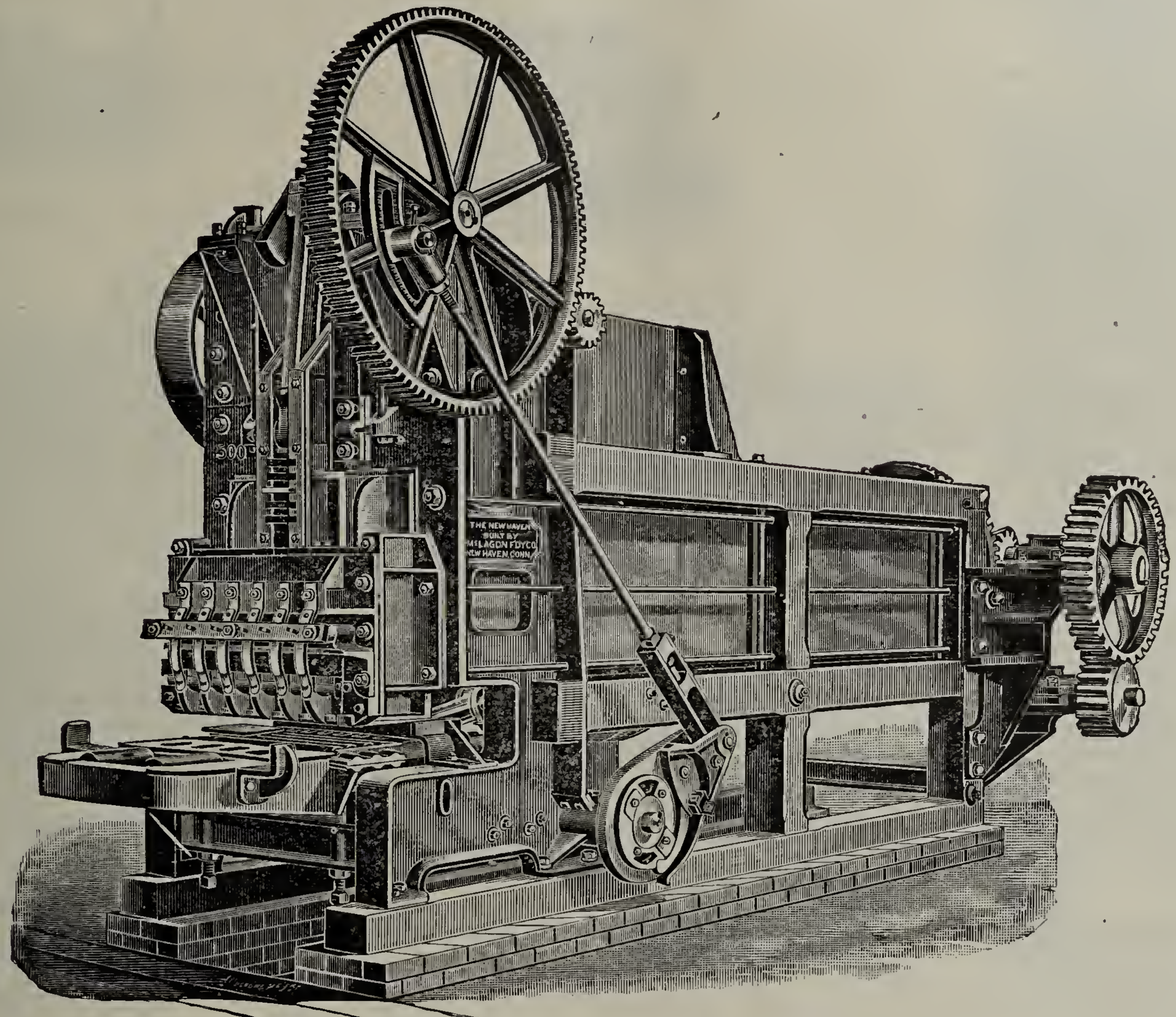
T. A. RANDALL & CO.

Indianapolis, Ind.

Endurance the Crowning Quality

The "New Haven" Horizontal Brick Machine is the Strongest Soft Clay Brick Machine in the World.

It is adapted to work any clay and is suitable for any yard, large or small, that uses steam for motive power. The brick made on it are solid and square, having smooth surfaces and sharp corners. For ***Quantity*** and ***Quality*** of production we challenge comparison with any machine built. The capacity of the machine is really limited only to the facilities for handling the brick as they are made.



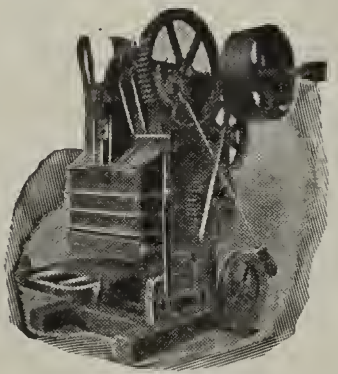
"NEW HAVEN" HORIZONTAL BRICK MACHINE.

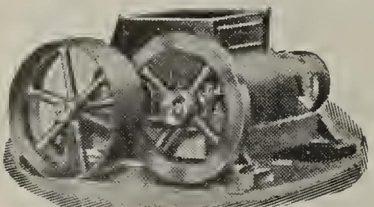
We will be pleased to submit estimates for complete plant or any portion of one. We can furnish machinery of the most modern and approved construction for soft mud plants of any capacity at reasonable prices. Shafting, hangers, bearings, pulleys, gearing and machine work of all description.

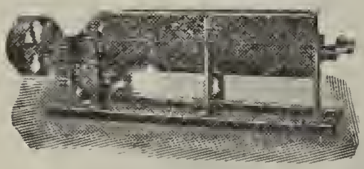
The EASTERN MACHINERY CO.

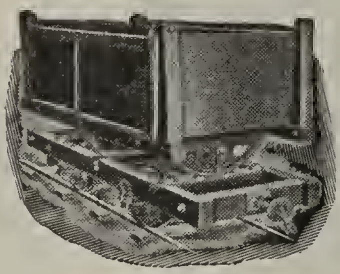
NEW HAVEN, CONN.

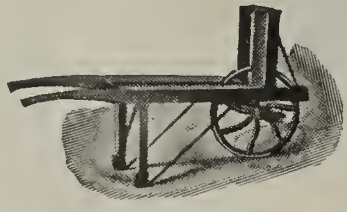
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

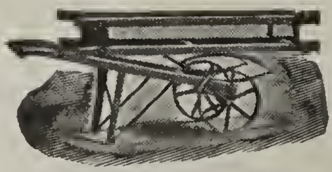

Vertical Brick Machine

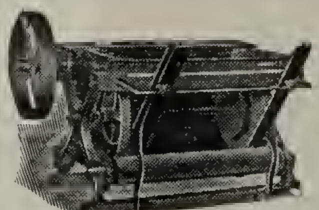

Style "A" and "P" Disintegrator


Double Geared Pug Mill


Side Dump Car

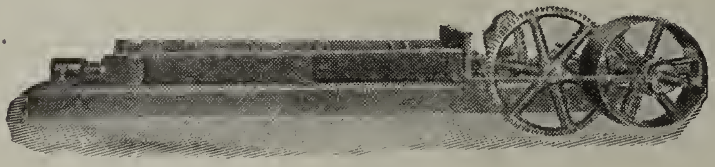

No. 6 Barrow


Double Deck Truck

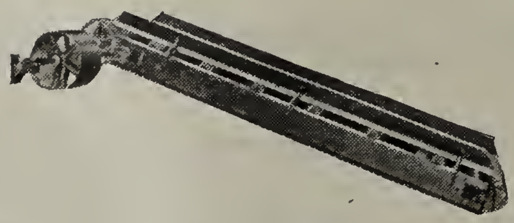

Style "A" Mould Sander

Style "P" Compound Disintegrator and Crusher

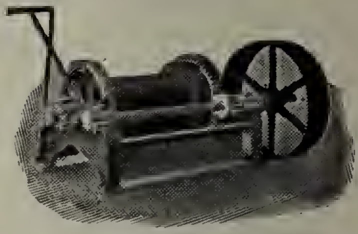
Single Geared Pug Mill

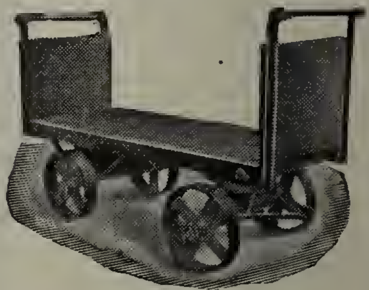

Feeder or Granulator

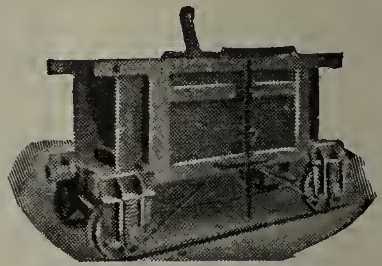
The Potts Rocker Grate
For any size fire box on boiler or kilns

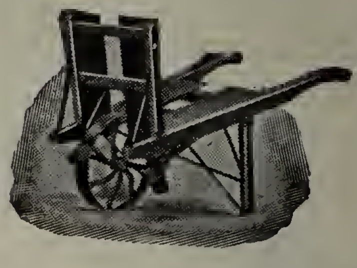

Clay Elevator.

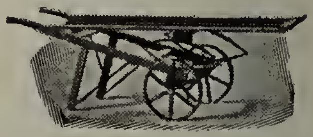
Style "P" Roller-Crusher


Style "B" Winding Drum


Mule Truck


Bottom Dump Car


No. 2 Barrow


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for Prices.

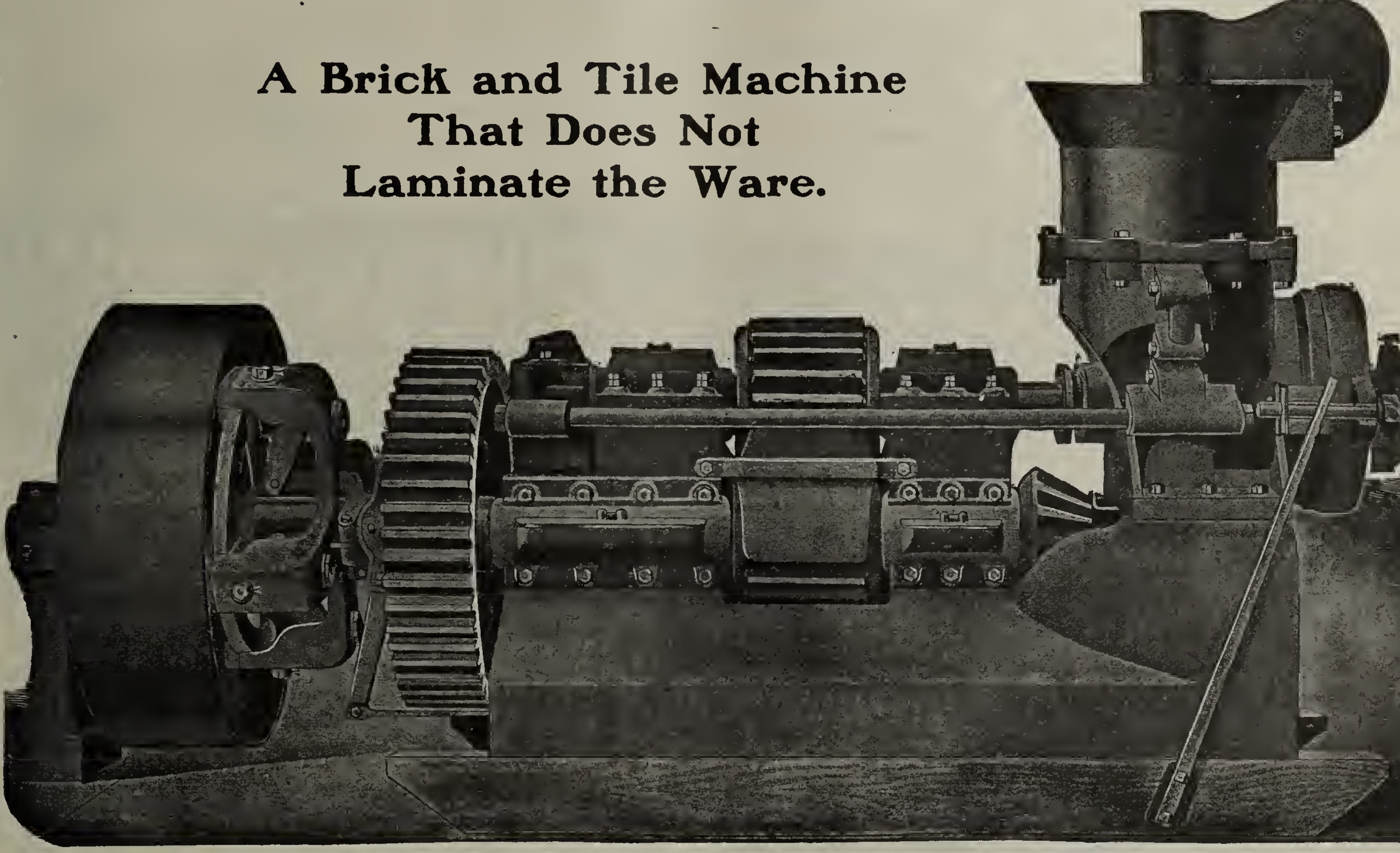
If it's to be Had We Have it.

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

**A Brick and Tile Machine
That Does Not
Laminate the Ware.**



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

Write for Catalog and Prices.

THE WALLACE MFG. CO.

FRANKFORT, IND.

JOIN THE

BOOST

BUILD WITH BRICK

BOOST

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

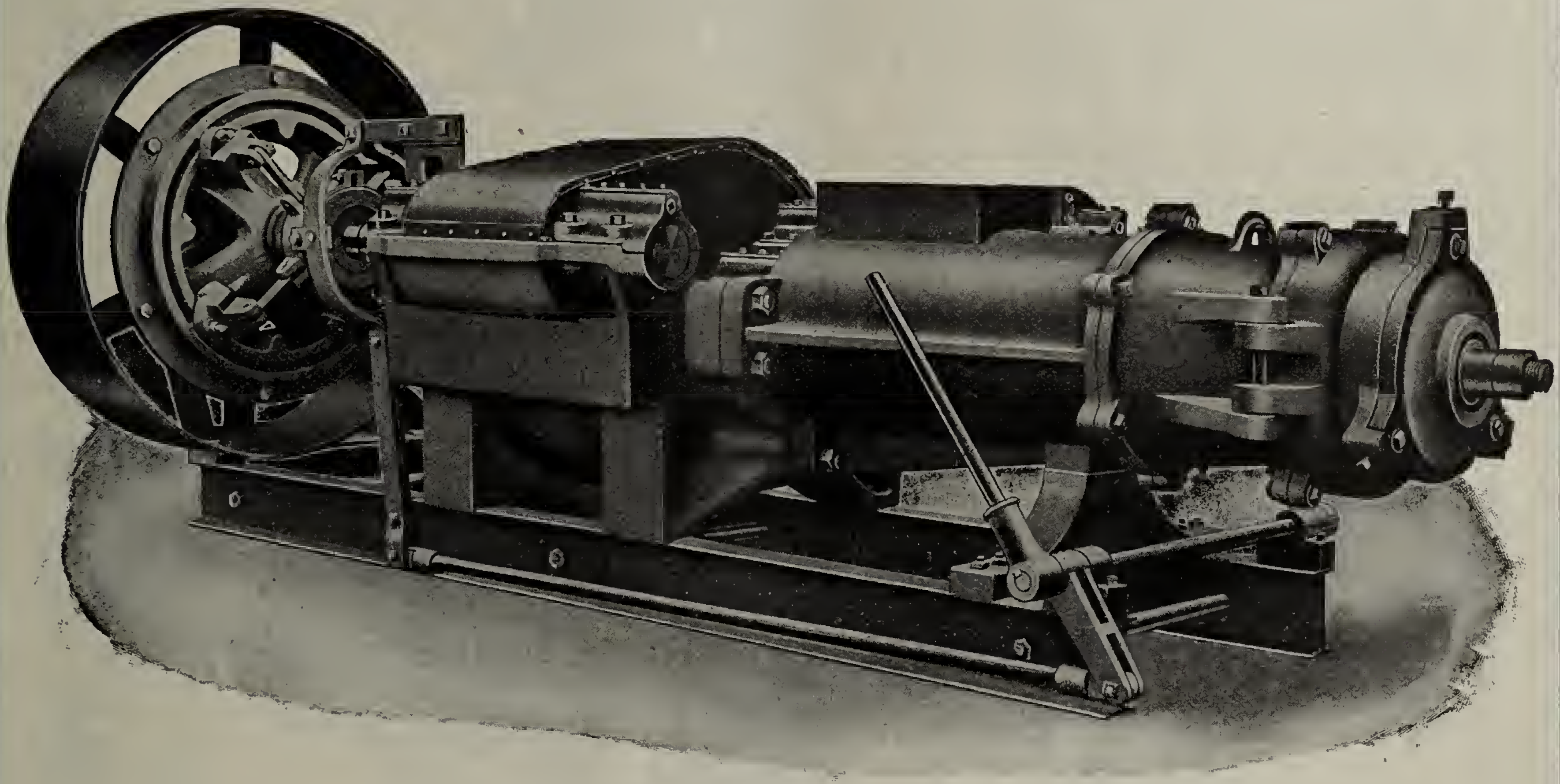
(Cross out the items not wanted, fill in and mail us the coupon.)

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

The Brewer No. 88 Horizontal

DRAIN TILE MACHINE

A high grade, high speed, heavy duty pattern, new enough to be up to the minute, but old enough to have shown what it can do.



Here Are a Few Construction Points:

Cut gears, covered and running in oil.
Gear frame cast in one piece.
Cylinder cast in one piece.
Hammered steel shafts. Self-oiling bearings.
Sectional lined screw case. Heavy 29-in. disc clutch.
Tool steel bushed dies.

Ask for complete catalog, references and prices.

H. BREWER & COMPANY, Tecumseh, Mich.

**HERE IS
A
KILN
THAT WILL
DO AWAY
WITH
YOUR
KILN LOSSES**

The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

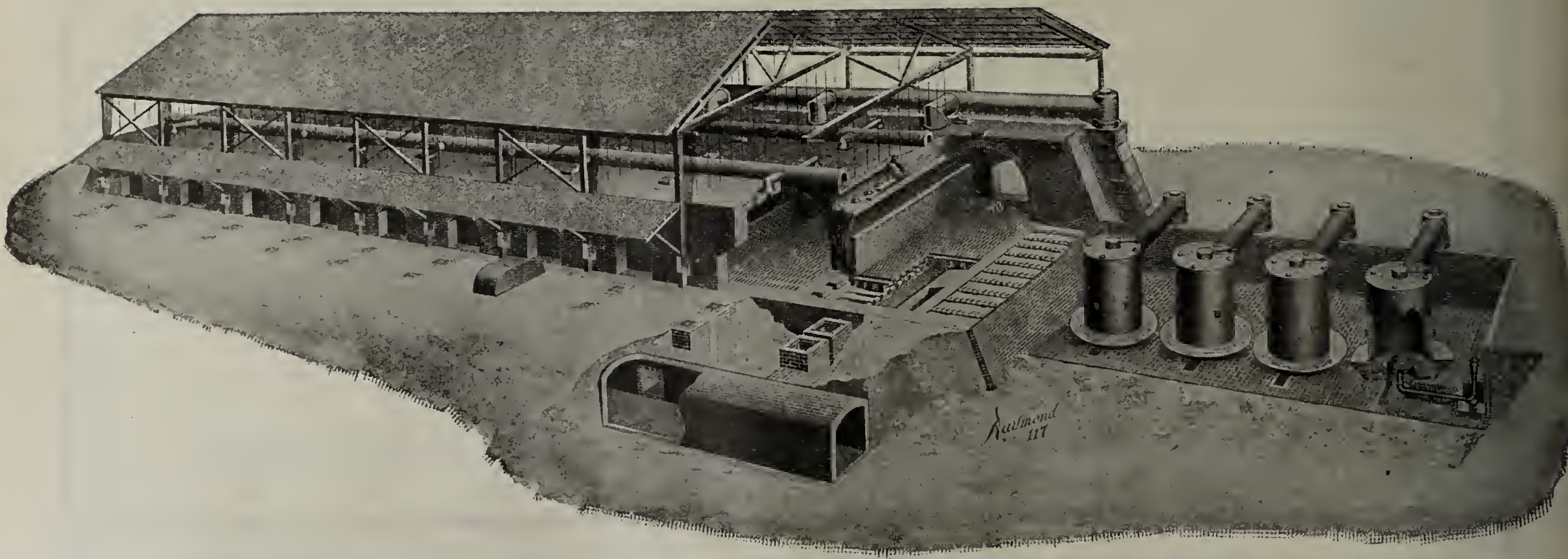
That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

International Clay Machinery Co.

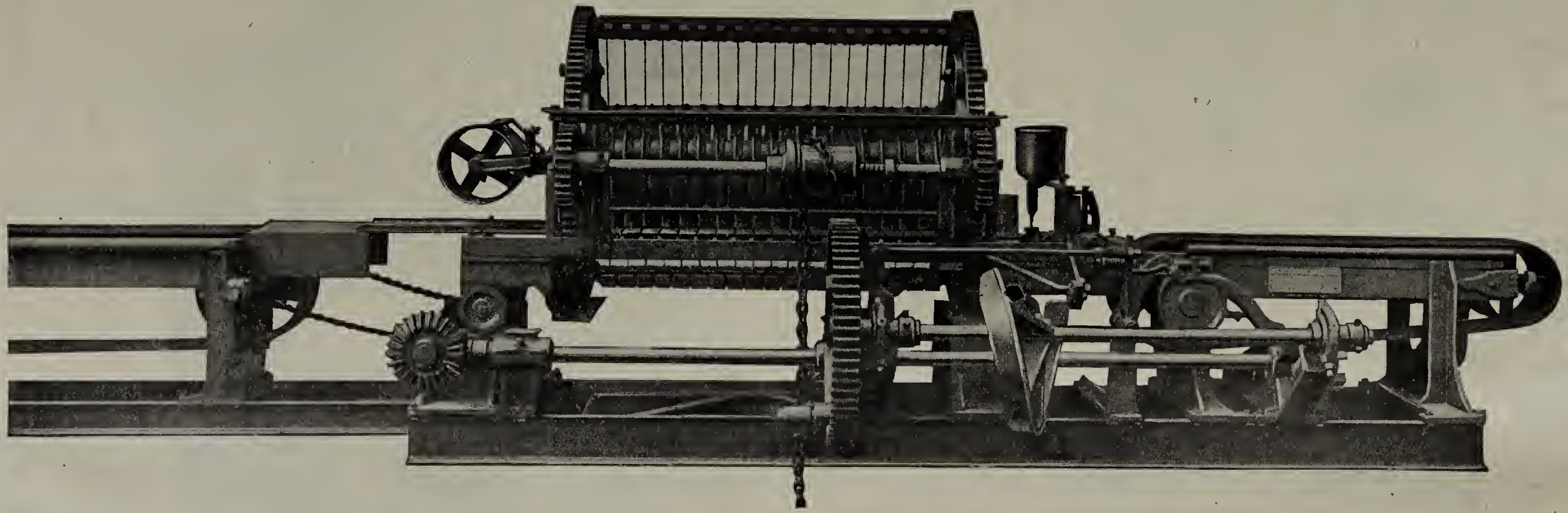
Dayton, Ohio, U. S. A.



The Producer Gas Fired Continuous Kiln

Steele's New No. 18 Automatic Side Cutter

Capacity 15,000 brick per hour. **Weight 6,000 lbs.**



The power is applied to the reel so as to offer no resistance to the carriage. In fact, it helps start it moving.

The reel is driven by crank motion, which gradually starts and stops it, eliminating shocks and jars.

The back platens are fitted with spring jaws, to prevent breakage of wires.

The best wire suspension known, making possible effective wire cleaners.

This cutter solves a hard problem in the most effective way yet attained, especially in very large capacities.

Investigate.

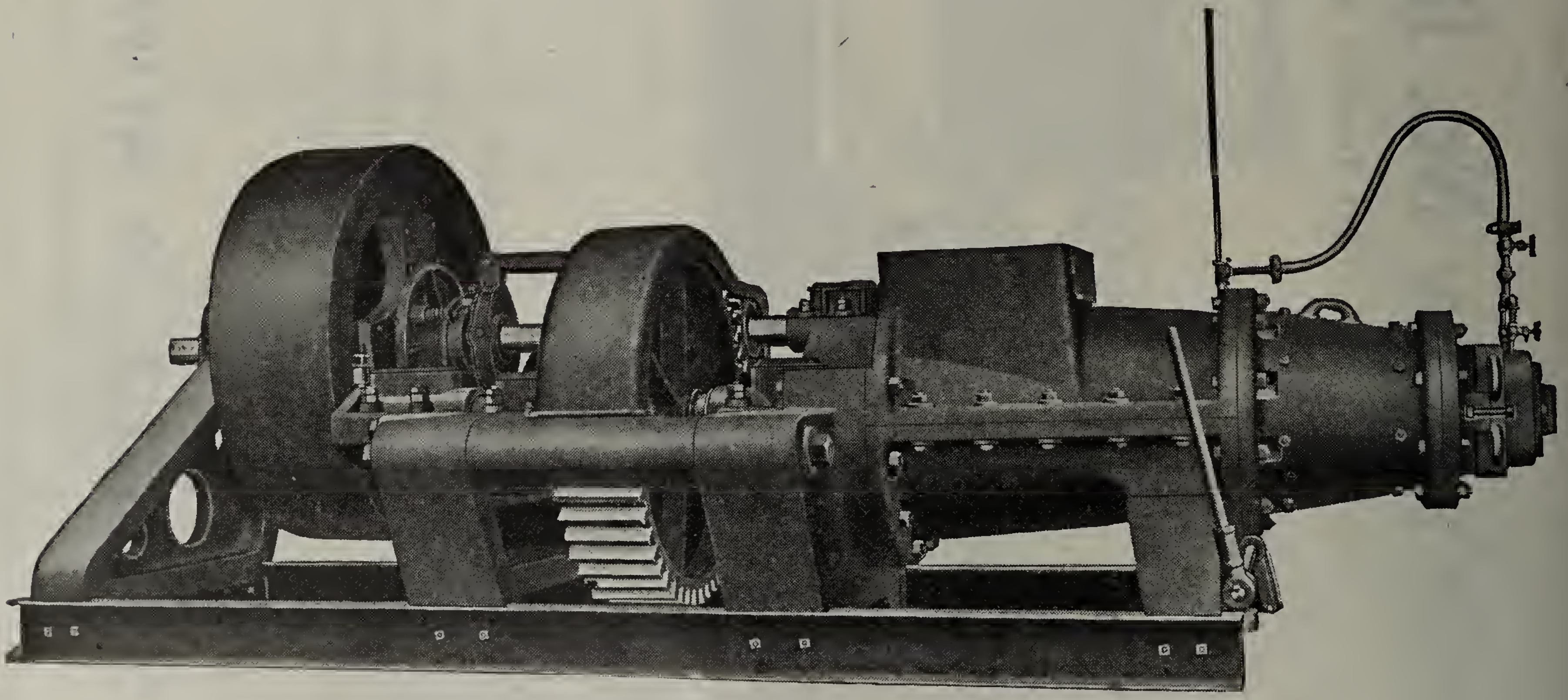
J. C. STEELE & SONS, **Statesville, N. C.**

Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

BUILT BY EXPERIENCE

A successful brick machine, like a solid reputation, cannot be built in a few days—nor in a year. The building of a Freese machine means something more than the assembling of its parts. In its construction is the experience of thirty-three years' active manufacture of this type of brick machine—the elimination of every known defect and the perfection of every proven detail of the hundreds of machines that have gone before.

It is this experience—this education in the designing, proportioning and building of this one class of machinery that has produced the Model GC Brick Machine. It has the slow, quiet running gearing, and the accessibility that the mechanic appreciates; the repair and power economy, and the quality-producing ability that shows in the ledger.



Model GC Brick Machine.

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For
Sixty-Three
Years
The Name

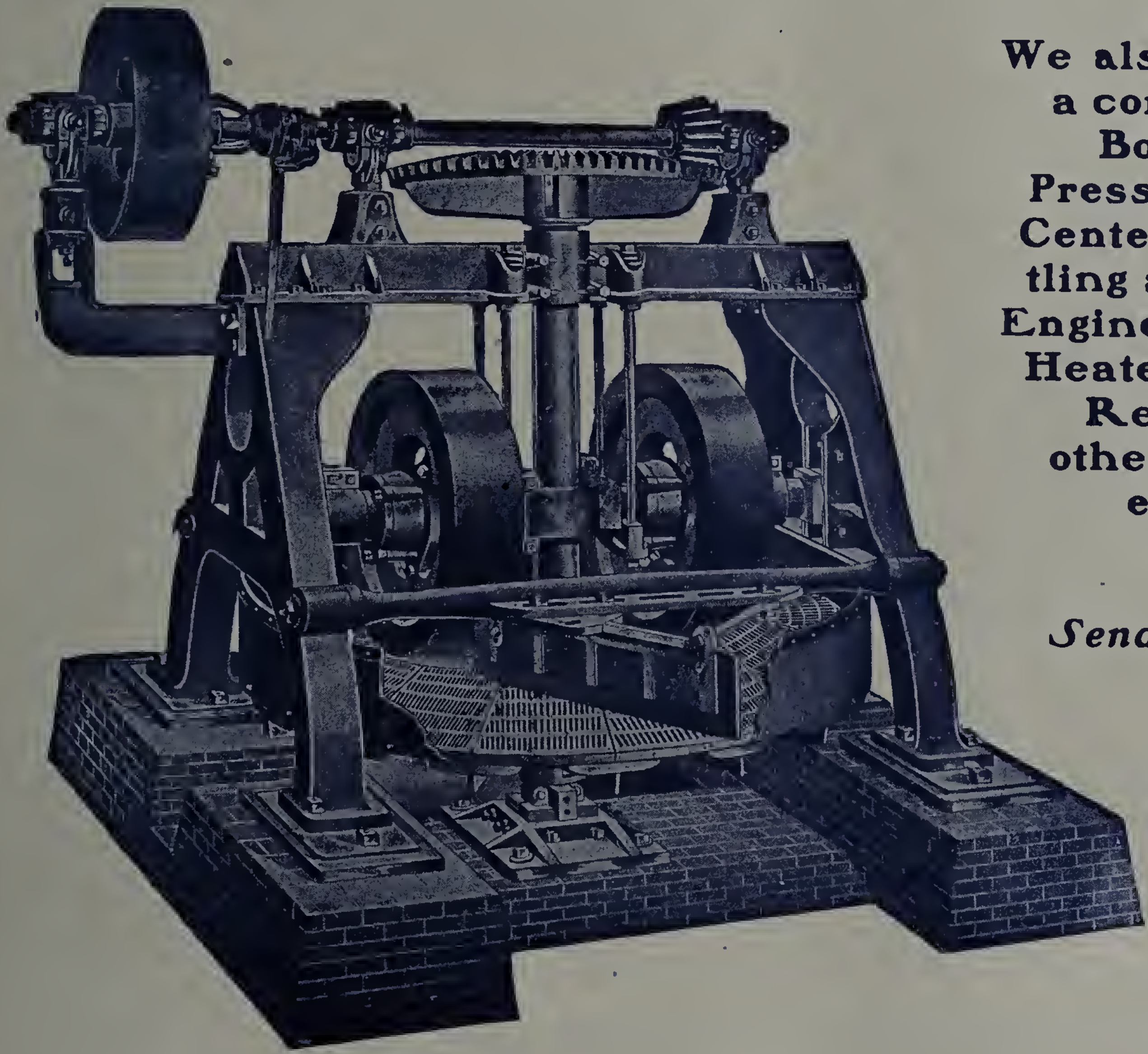
Frost

Has stood for all
that is best in
Power Plant
Equipment,
Crushing and
Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



**We also manufacture
a complete line of
Boilers for all
Pressures, Side and
Center Crank Throttling and Automatic
Engines, Feed Water
Heaters, Tanks, Air
Receivers and
other power plant
equipment.**

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO." Chicago.

Mention The Clay-Worker.

The Wise Man of FATE

"Does as Much Work As Sixteen Men and Sixteen Horses"

---Says President Dillman.

This is what the Lincoln Clay Products Co., of Lincoln, Cal., says of "The Plymouth" Gasoline locomotive, which it installed to supplant men and horses in its clay-hauling system.

And this same concern thought so well of "The Plymouth" a second locomotive was purchased, when increased business warranted an increase in the output.

The Plymouth

Gasoline Industrial Locomotive

Convinces the Lincoln Clay Products Co. of its Economy

The Lincoln Clay Products Co. bought its first Plymouth Locomotive after investigating all other hauling systems.

It was convinced at the start that "The Plymouth" principle was the most economical and the most efficient.

It had the low first-cost in its favor—it had the low cost of fuel in its favor—it had the low-cost of operating in its favor, and it had the greatest draw-bar pull and the greatest traction of any locomotive of the same size and horsepower on the market.

Read What Mr. Dillman Says:---

M. J. Dillman, president of the Lincoln Clay Products Co., writing under date of March 26, 1915, says, in part:

"We are now hauling four loaded cars (this was increased later to seven cars to a train) weighing about 20,000 lbs., up a three per cent grade, and apparently without any effort, and we think the Plymouth will do much more when called upon.

"The Plymouth moves these cars some 800 feet to connect with a cable hoist and returns to shale bank in a quarter of the time it took one large horse to move one car over the same track and return.

"In other words, as each horse would require one man, the Plymouth does as much as sixteen men and sixteen horses. "No use talking of the saving, as well as the expedition of the work!"

And then Mr. Dillman opened negotiations for a second Plymouth, which he later bought and installed, this being shown in the accompanying picture.

These are the two Plymouths at the shale bank of the Lincoln Clay Products Co. The one on the upper range shows 7 cars on a 3% grade, hauling 15 tons.

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio.
Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

(Firm Name) ....
(City) ....
(Street) ....
(State) ....

If the Plymouth Can Do This for Others---

If The Plymouth can replace sixteen men and sixteen horses for the Lincoln Clay Products Co., isn't it reasonable to suppose that it can do as much for you?

GET BOOK OF FACTS We have a booklet that not only describes the Plymouth but also illustrates many similar installations to the one at Lincoln, with full cost data on operation and maintenance. A copy is yours for the asking.

USE COUPON For your convenience there is a coupon at the left—fill it out and mail today—that's the way.

The J. D. Fate Company

242 Riggs Ave.,
Plymouth, Ohio

The Fate Special Premier Machine

Will Enable YOU to Make Perfect Hollow Ware and Accomplish This at a Living Profit

Failure to make a merchantable hollow ware may be attributed to the machine as often as to the clay or to the man that manipulates the clay.

Makeshift machinery won't do it. Hollow ware machines must be HOLLOW ware machines, and this is WHY the Fate Special Premier Hollow Ware Machine is making a profitable product out of a clay that is declared to be difficult to handle.

The Wise Man of FATE

"The Fate Special Premier"

Will Make Hollow Ware at a Living Profit, Because:

It has the proper mixing chamber with the specially designed knives to give just the right mixture to the clay—absolutely necessary to the manufacture of salable hollow ware.

It has the proper "force" to the clay to enable it to fill out all the mold and deliver to the off-bearing belt a perfectly made ware.

It has the properly designed dies.

It has stability.

It has durability.

It has the maximum of productiveness at the minimum of cost.

We Make Everything for the Clayworker

"The House of Fate" manufactures everything a clayworker uses—and every machine or device is designed for its special purpose just as are "Fate Special Premier Hollow Ware Machines."

There are no makeshifts in Fate machinery—no patched up machines "to answer a purpose."

Let Fate's Free Service Help You

Our Engineering Department is at your service and FREE in any of the problems that confront you.

Give us a frank statement of your needs or requirements and let us make you a proposal. You do not have to buy or agree to buy anything.

Use the Coupon

At the right there is a coupon. Check off the items you are interested in and stick this coupon to your letter head, or to a slip of paper, and mail it today.

The Clay Products Co., Brazil, Ind.

Proves This Statement to be TRUE!

This concern, one of the largest and most successful clay product plants in the United States, is making hollow ware with a "Fate Special Premier Hollow Ware Machine."

Two of these big "Premier" are used on making conduit ware—one of the most difficult of wares to manufacture, because of the exacting conditions.

Not only must this ware be symmetrical, both inside and out, but the ends of the ducts must be perpendicular to sides. Then, too, there must be no projections or defects which will weaken the conduits, or which will prove an obstacle in pulling cables through the ducts. All duct holes must be well centered and all duct walls must be of a specific thickness.

The multiple ducts must have dowell pinholes for perfect alignment so that each hole will fit perfectly and be interchangeable in all parts.

No other machine will give such a uniform ware as the "Fate Special Premier" and, at the same time permit a living profit, and the Clay Product Company has proven this to their own satisfaction.

You Can Do the Same

If the "Fate Special Premier" will make **conduit** ware successfully it certainly can make any hollow ware at a profit.

We have a special bulletin on hollow ware machinery—why not send for it and investigate a little?

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, Ohio.

We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner

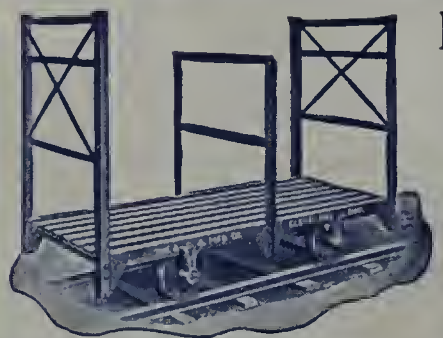
☐ Auger Brick Machinery
☐ Hollow Ware Machinery
☐ Disintegrators
☐ Conveyors
☐ Drain Tile Machinery
☐ Full Equipment
☐ Industrial Locomotives
☐ Clay Feeders
☐ Pug Mills
☐ Crushers
☐ Elevators
☐ Clay Testing

Name..

Town.................................. .... State..................

The J. D. Fate Co.

242 Riggs Ave. Plymouth, Ohio

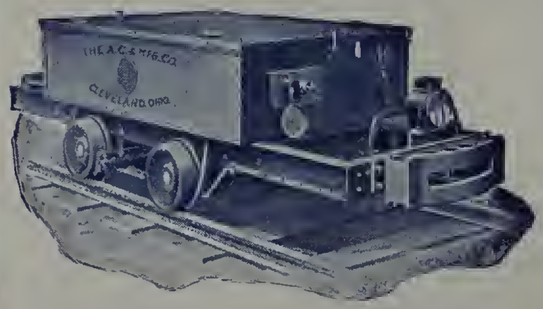


No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.

ATLAS
High Efficiency
Cars and
Electric Locomotives



Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
Dept. D
1189 Marquette Road, Cleveland, Ohio

BAIRD

POT MOLDING MACHINERY

We specialize
Machines
for the
Manufacture
of Pottery
and Guarantee
Every One We Sell

Write us for information

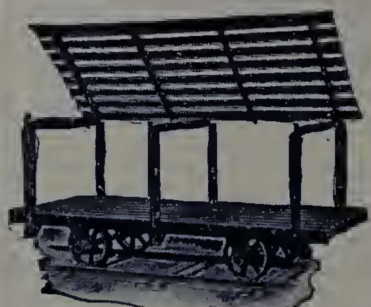
**Baird
Machine & Mfg. Co.**
54-56 Jefferson Ave.
Detroit, Mich.

With Chase Flexible and Reversible Bearing and Folding Deck.

Single, Double and Triple Deck Dryer Cars, Transfer and Dump Cars, Turntables, Switches and Trackage.

The Chase Foundry & Mfg. Co., Columbus, O.

"LAKEWOOD LINE CARS"



LAKEWOOD NO. 166

Dryer Cars
Rack Cars
Dump Cars

Our No. 166 car was designed to combine strength and rigidity with lightness, thereby building a light running car, yet strong enough to withstand hard usage. See it before buying.

The Lakewood Engineering Co.
(Formerly The Ohio Ceramic Engineering Co.)
Cleveland, Ohio

NEW YORK PHILADELPHIA PITTSBURGH
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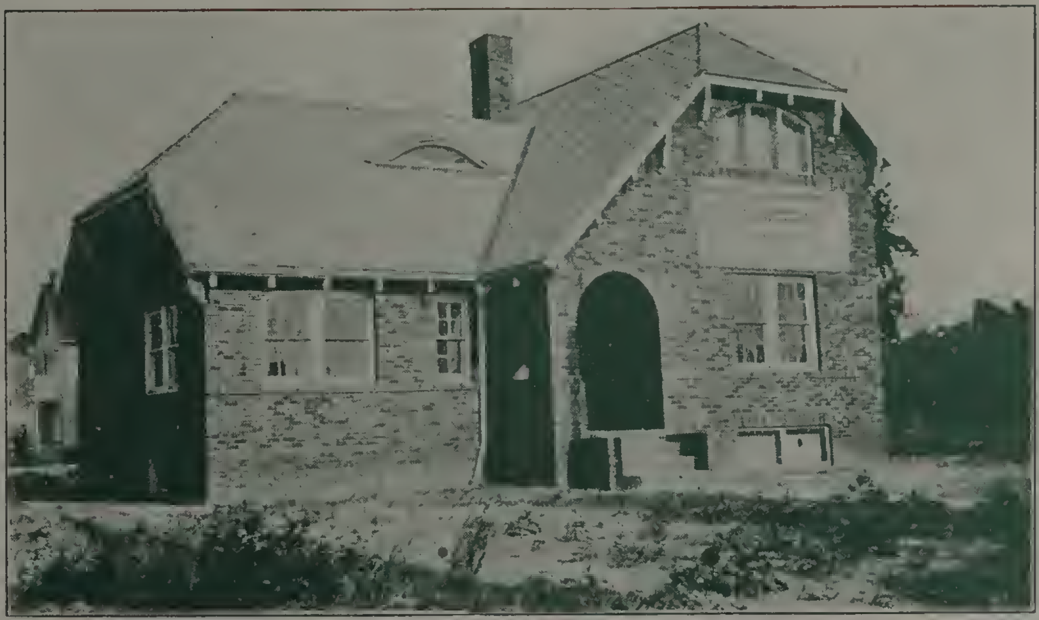
THE CLAY WORKER

CHRISTMAS 1916

CLAY PRODUCTS EXPOSITION PRIZE BUNGALOW



Build with Brick—A Low Cost but Attractive Residence Erected in Cleveland Through the Influence of the Complete Building Show. See page 521.

T·A·RANDALL·&·CO
PUBLISHERS·INDIANAPOLIS

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BUYERS' READY REFERENCE LIST
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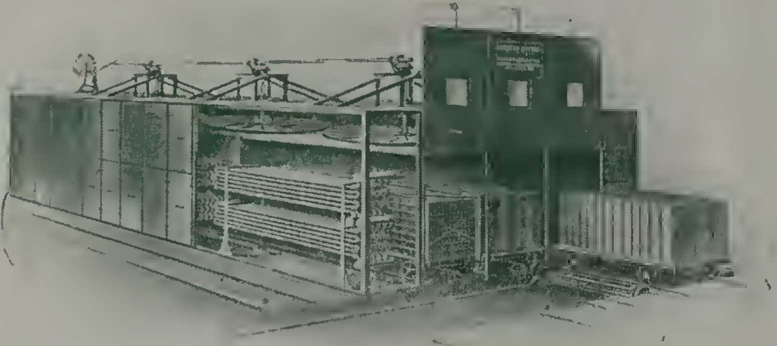
"Proctor" DRYERS

We respectfully invite you to
investigate the merits of

THE



"PROCTOR" DRYER for CLAY PRODUCTS

↓

To help you in your investigation we make the following statements of fact—not claims—

⁂

One brick plant now uses only 60 dryer cars whereas formerly they used 730, a saving of 670 cars and the space they took up.

⁂

In another plant the "PROCTOR" is safely drying nine duct conduit in 6 hours —former time 48 hours.

⁂

4-in. drain tile in 60 minutes.

⁂

Standard plastic fire clay brick in 12 hours —former time 48 hours.

⁂

You owe it to yourself to investigate this wonderful dryer that cuts down the cost and difficulty of drying.

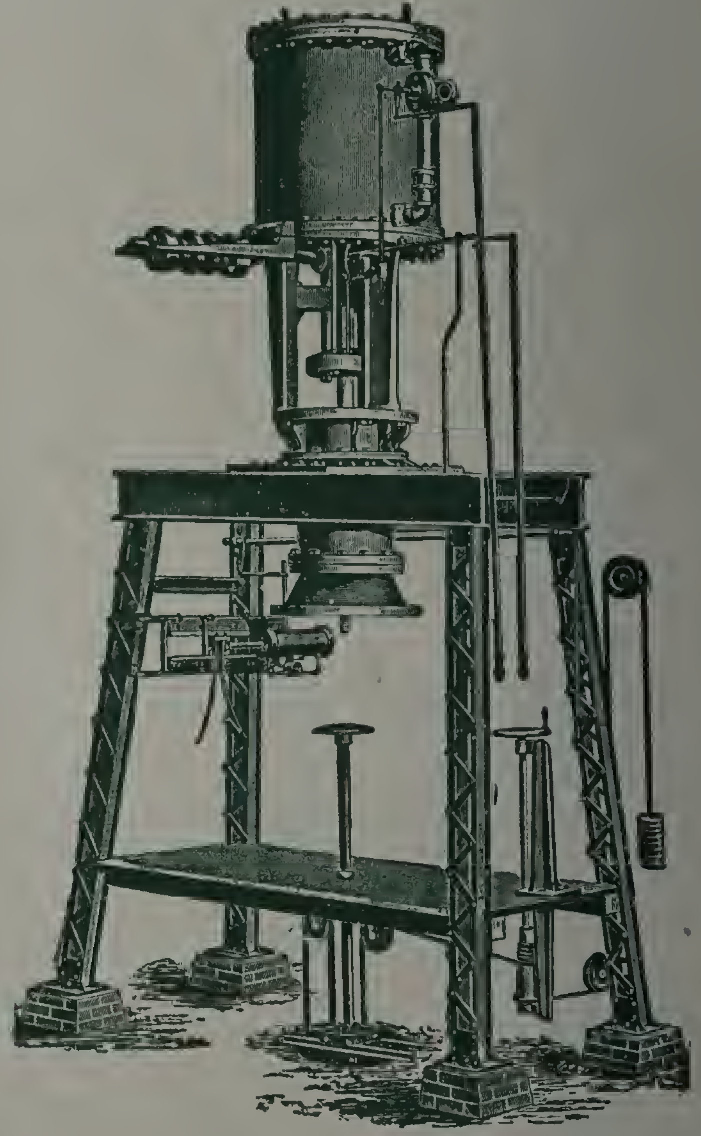
⁂

Start your investigation now—write us.

The Philadelphia Textile Machinery Co.
Philadelphia, Pa.

IT TAKES THE BEST TO MAKE THE BEST.

You cannot get a piece of steel out of a piece of lead.



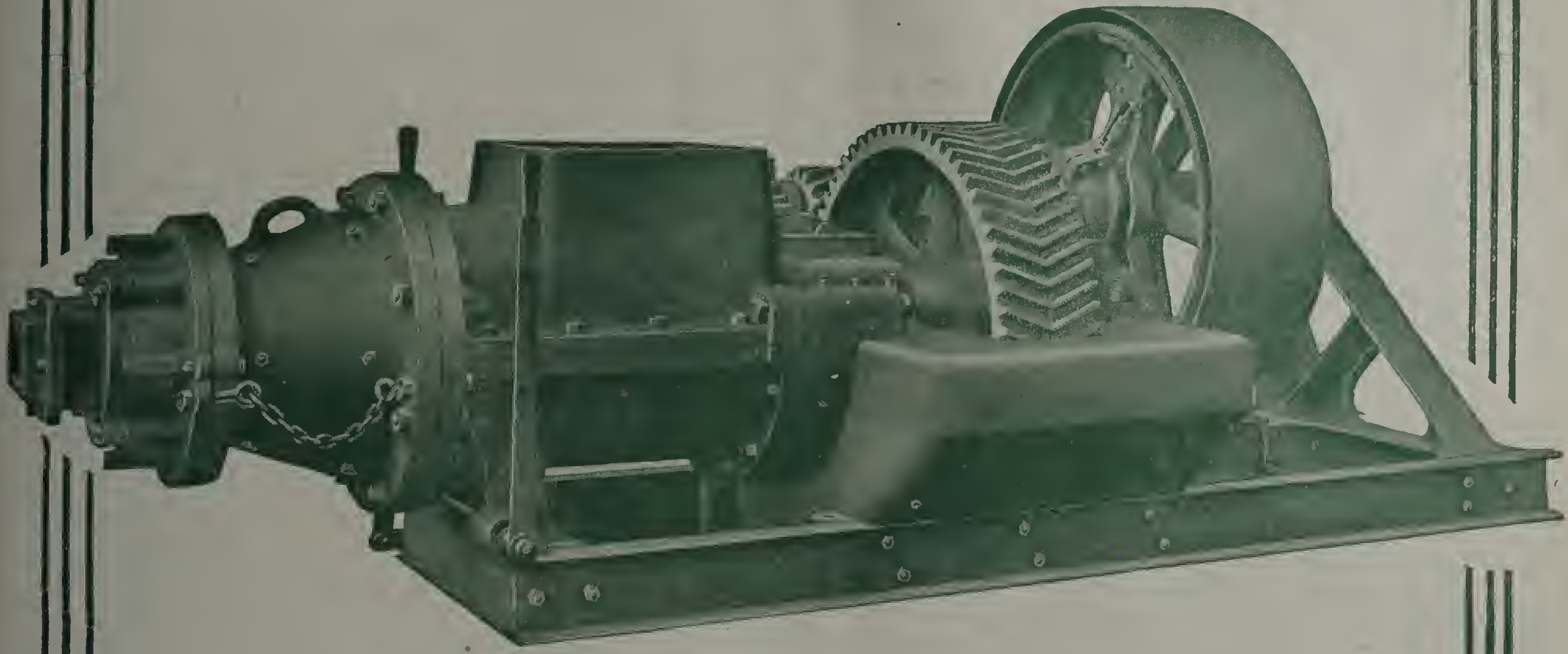
PARTIAL LIST OF REFERENCES BELOW:

W. S. Dickey Clay Mfg. Co.	Kansas City, Mo.
Wm. E. Dee Clay Mfg. Co.	Chicago, Ill.
Denver Sewer Pipe Co.	Denver, Colo.
Denny-Renton Clay & Coal Co.	Seattle, Wash.
Los Angeles Pressed Brick Co.	Los Angeles, Cal.
Independent Sewer Pipe Co.	Los Angeles, Cal.
Robinson Clay Product Co.	Akron, O.
Robinson-Graves Co.	Uhrichsville, O.
Pomona Terra Cotta Co.	Pomona, N. C.

and above 150 other of the largest clayworking concerns in important commercial centers of the United States.

The Taplin, Rice-Clerkin Co.

The largest manufacturers of the best Sewer Pipe and Clayworking Machinery "that produces the results" without trouble to the manufacturer, in the United States.



THE ROLLING MILL STYLE OF GEAR.

a type of gearing which has been used in rolling mill and steel mill service wherever possible because of its strength, smooth running qualities and ability to withstand shocks.

We are building this single gear machine in two sizes---one for 25,000 to 30,000, the other 50,000 to 60,000. Frame is one piece casting, with oil pan on bottom.

Both brick machine and pug mill have marine type thrust bearing in front side of frame and ample space between drum and bearing for clay to drop without getting into bearing.

Write us for information on these uptodate machines.

THE BONNOT COMPANY
CANTON, OHIO

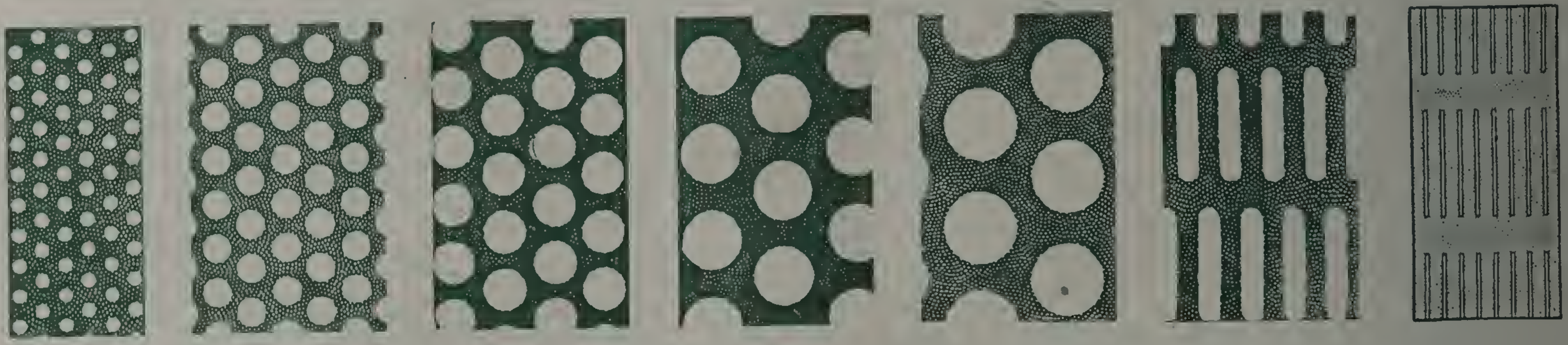
909 N. Y. Life Bldg.
KANSAS CITY, MO.

211 Higgins Bldg.
LOS ANGELES, CAL.

PERFORATED STEEL SCREENS

FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

Prepare for a Busy Season and a Labor Famine!

Make Yourself Independent of Your Wheeling Gang When the Rush Comes.

BARKWILL BRICK CO. PLANT, CLEVELAND, OHIO, SHOWING THE MATHEWS GRAVITY BRICK CONVEYER.

Don't wait until you are in trouble before you order an outfit of Mathews Gravity Conveyers. You cannot expect us to have a system to fit your requirements all made up ready to ship the day you order it, no matter how badly you need it. We always have orders ahead of yours, and we need time—sometimes several weeks—to catch up with an accumulation of unfilled orders. Ask us now to send the nearest representative. He will tell you what you need, the cost, and get the order on file without waste of valuable time.

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MATHEWS GRAVITY CARRIER CO.
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It Isn't the "Original Cost,"

it's the "UPKEEP" of MOST dryers which robs the manufacturer of Clay Products of his profits.

The "ORIGINAL COST" of

RODGERS WASTE HEAT DRYERS

is NO GREATER than that of other dryers, and the "UPKEEP" FAR BELOW that of other dryers.

Manufacturers who build Rodgers Waste Heat Dryers, in which to dry their products, suffer neither from "ORIGINAL COST" nor "UPKEEP." They "POCKET" their profits.

When YOU build, better build to "POCKET" yours.

L. E. RODGERS ENGINEERING CO.

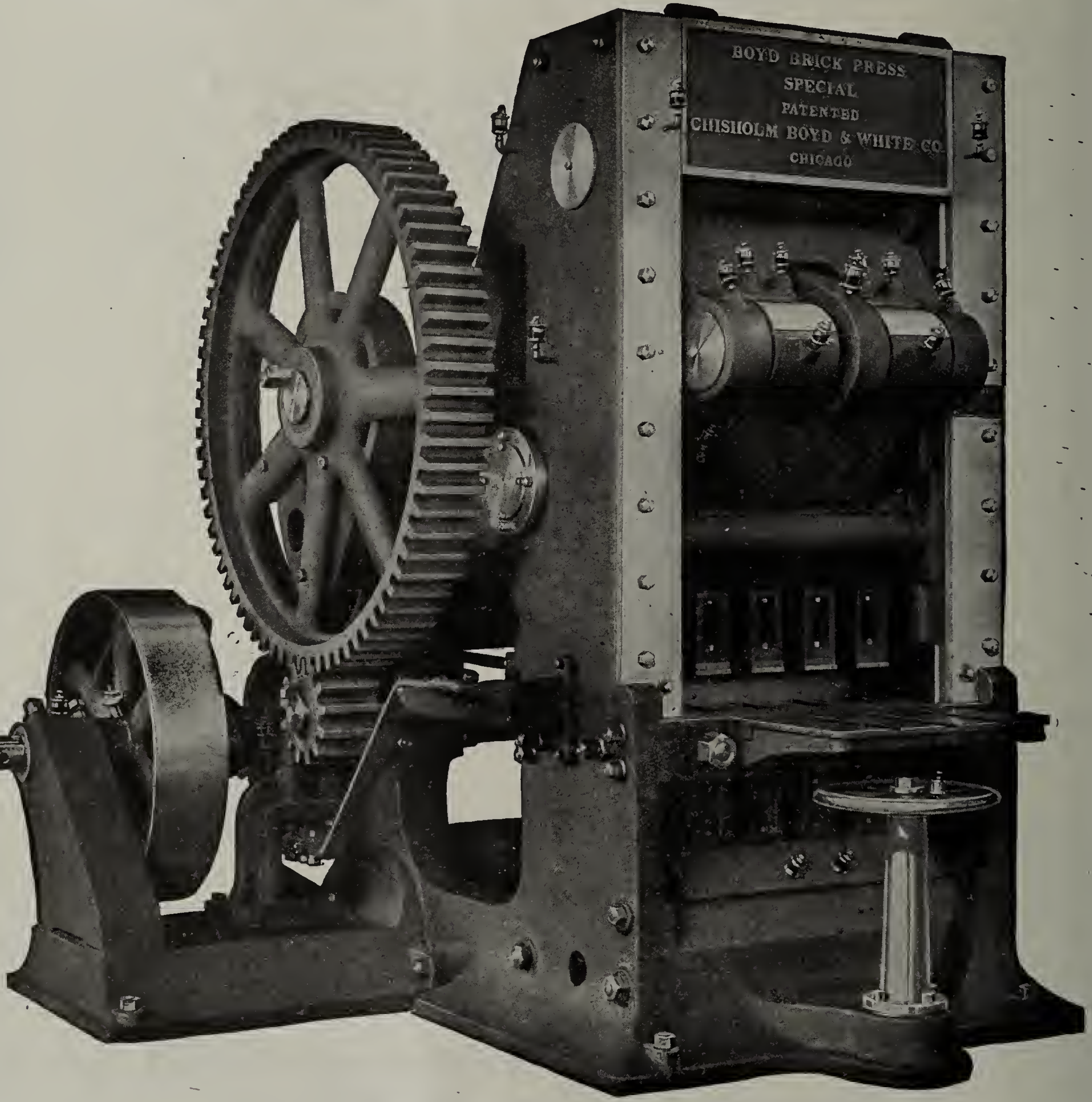
Waste Heat Dryer Specialists
Brick Works Engineers

Largest Manufacturers of Brick Drying Equipment in the United States
General Offices ZANESVILLE, OHIO

RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price."



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FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

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To Find Any Particular Firm or Advertisement See "Index to Ads" as Cited on Front Cover Page.

Ammeters.

The Brown Instrument Co.

Analysists and Chemists.

Ceramic Supply & Con. Co.
N. J. State University.

Arch Cutting Apparatus.

Ceramic Supply & Con. Co.

Automatic Clay Bin Emptier.

Fate Co., The J. D.
International Clay Mach. Co.

Automatic Cutting Tables.

(See Cutting Tables.)

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American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
H. Brewer & Co.
Carnell, Geo.
Chambers Bros. Co.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Barytes, Carbonate of.

Roessler-Hasslacher Chem. Co.

Bearings, Roller.

(See Supplies.)

Belting.

Ceramic Supply & Con. Co.
Gandy Belting Co.

Belt Conveyors.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Gandy Belting Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Blowers.

American Clay Machinery Co.
International Clay Mach. Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Boilers.

American Clay Machinery Co.
Frost Mfg. Co.

Brick (Building).

Illinois Brick Co.
Kansas Buff Brick & Mfg. Co.
Kushequa Brick Co.
Purington Paving Brick Co.

Brick (Fire).

Parker-Russell M. & M. Co.

Brick (Paving).

Alton Brick Co.
Aspha-Bric Corporation.
Bessemer Limestone Co.
Clinton Paving Brick Co.
Dunn Wire-Cut-Lug Brick Co.
Mayer Brick Co.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Murphysboro Paving Brick Co.
Natl. Pav. Brick Mfrs. Assn.
Purington Paving Brick Co.
Terre Haute Vit. Brick Co.
Shawmut Vit. Pav. Brick Wks.

Brick Conveyors.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.

Brick and Tile Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Wks.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Chisholm, Boyd & White Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers' Equipment Co.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Brick Machines (Soft Mud).

American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
Hocking Valley Products Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Brick Machines (Dry Press).

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mueller Bros.

Brick Recutter.

International Clay Mach. Co.

Brick Setting Machinery.

American Clay Machinery Co.

Buffing Machinery.

American Clay Machinery Co.

Burning and Drying Systems.

American Clay Machinery Co.
American Blower Co.
Boss, John C.
Dennis, F. W.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Schaffer Eng. & Equip. Co.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.

(See Dryer and Dumping Cars.)

Carbide Coating.

Stowell, E. R.

Castings.

American Clay Machinery Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.

Brick & Clay Engineering Co.
Hoehne, Richard B.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.

Clay Crushers and Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Brewer Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Phillips & McLaren Co.
Potts & Co., C. & A.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clay Dryers.

American Process Co.

Clay Feeders and Mixers.

American Clay Machinery Co.
Brewer & Co., H.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Schaffer Eng. & Equip. Co.
Taplin-Rice-Clerkin Co.

Clay Gatherers.

(See Scrapers.)

Clay Steamers.

American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.

American Clay Machinery Co.
Fate Co., The J. D.
Hoehne, Richard B.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.

(See Supplies.)

Coloring Materials.

Chattanooga Paint Co.
National Paint & Manganese Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.

Orton, Edward, Jr.

Consulting Engineers.

Hoehne, Richard B.
Lovejoy, Ellis.
Richardson, W. D.

Conveying Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Mueller Bros.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.

American Clay Machinery Co.
International Clay Mach. Co.

Contracting Engineers.

Ceramic Supply & Con. Co.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.

Couplings.

(See Supplies.)

Cutting Tables (Brick & Tile).

American Clay Machinery Co.
Bonnot Co., The
Brewer & Co., H.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Mueller Bros.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cutting Wires.

American Clay Machinery Co.
Brewer & Co., H.
Ceramic Supply & Con. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mittler Wire Mfg. Co.

Dampers.

(See Supplies.)

Dies.

Louisville Machine Co., The
(See Supplies.)

Disintegrators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Drills.

Ceramic Supply & Con. Co.

Draft Gauges.

Brown Instrument Co.
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Drain Tile Machinery.

(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.

(See Supplies.)

Dryers.

American Clay Machinery Co.
American Process Co.
Brick & Clay Engineering Co.
Boss Co., John C.
Chambers Bros. Co.
Crosby Dryer Company.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
National Dry Kiln Co.
Philadelphia Textile Mach. Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.
X. L. Kiln & Dryer Co.

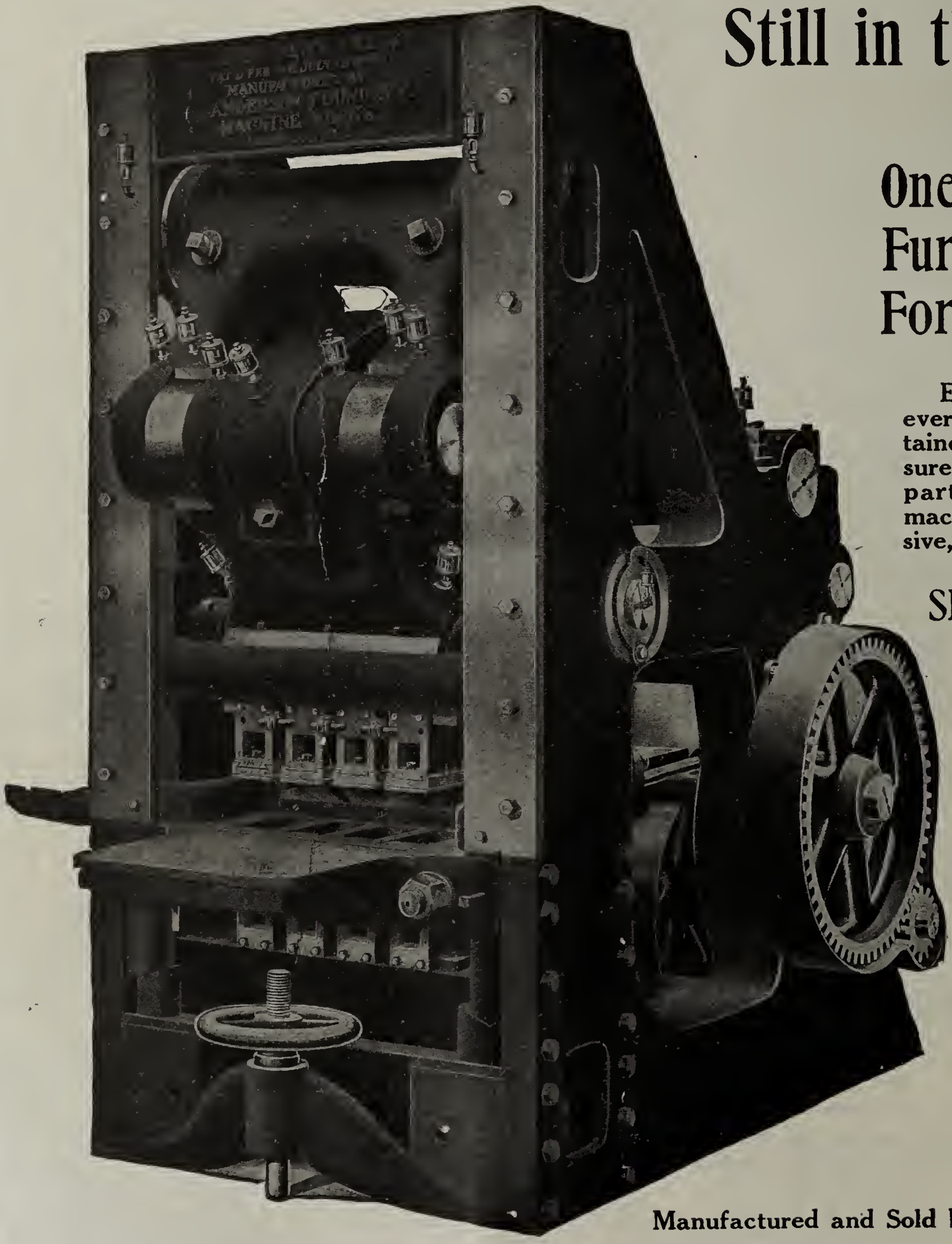
Dryer Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Brick & Clay Engineering Co.
Ceramic Supply & Con. Co.
Chambers Bros. Co.

(Continued on page 509.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

ANDERSON, IND.

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Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
National Dry Kiln Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Louisville Machine Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay-Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Brown Instrument Co., The
Ceramic Supply & Con. Co.
Thwing Instrument Co.

Electric Shovels.

Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
Beighlee Electric Co., The
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

Elevating Equipment.

(See Conveyors.)

Engines.

American Clay Machinery Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Lovejoy, Ellis.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Fans.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

Filter Presses.

American Clay Machinery Co.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Fire Brick and Fire Clay.

Parker-Russell M. & M. Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

Brick & Clay Engineering Co.
Brown Instrument Co., The
International Clay Mach. Co.

Gas Fire Continuous Kilns.

International Clay Mach. Co.

Gears.

(See Supplies.)

Granulators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Grates.

American Clay Machinery Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.

Gravity Carriers.

Mathews Gravity Carrier Co.
Taplin-Rice-Clerkin Co.

Gravity Haulage.

American Clay Machinery Co.

Hand-Power Presses.

American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Stevenson & Co.

Hand Winch.

(See Supplies.)

Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

American Clay Machinery Co.
Bonnot Co., The
Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Illustrators.

Lamb, J. & R.

Insurance.

Mantel, Tile and Grate Monthly.

(Continued on page 510.)

BLASTING MAKES EASIER SHOVELING AND QUICKER LOADING.

Keep the Plant Busy in Winter Days

The arrival of freezing temperature in the shale and clay mining territory compels many clay product plants to shut down. Their production is limited by weather conditions, and only a partial profit is derived from the plant.

By resorting to new methods of operation and

By Blasting With

DU PONT RED CROSS

Low Freezing Explosives

many of the brick and tile plants are able to keep their machinery supplied with raw material throughout the winter months.

Why have an idle plant when a few charges of explosives, properly placed, will supply an abundance of shale and clay for steam or hand shoveling? Get the maximum production and profit. Operate a 12-months' plant—not one governed by Jack Frost. Keep your plant working every day.

Learn this New Way To Blast Shale and Clay

Send for free booklet, "Explosives for Blasting Shale and Clay."

E. I. du Pont de Nemours & Company

Powder Makers Since 1802 Wilmington, Delaware

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Jacks.

(See Supplies.)

Kilns.

American Clay Machinery Co.
Boss Co., John C.
Brick & Clay Engineering Co.
F. W. Dennis.
Hook Patent Kiln Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Ohio Kiln Co., The
Richardson, W. D.
Smith Co., Claude.
X. L. Kiln & Dryer Co.
Yates, Alfred.

Kilns, Doors, Castings and Frames.

(See Supplies.)

Kiln Bands.

Holliday, W. J. & Co.

Knives.

(See Supplies.)

Locomotives.

Fate Co., The J. D.

Manganese.

(See Coloring Materials.)

Mechanical Draft.

American Clay Machinery Co.
Boss, J. C.
Rodgers Engr. Co., The L. E.

Mineral Paint.

(See Coloring Materials.)

Molds (Brick).

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Wallace Mfg. Co.

Mortar Colors.

(See Coloring Materials.)

Motor Trucks.

Fate Co., The J. D.

Oil Burners.

Schurs Oil Burner Co.

Paints.

(See Coloring Materials.)

Pallets.

Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).

(See Dry and Wet Pans.)

Paving Brick or Block.

(See Brick.)

Perforated Sheet Metal.

Caldwell & Sons, H. W.
Ceramic Supply & Con. Co.
Harrington & King Perf. Co.

Pitch (Paving).

Barrett Mfg. Co.

Plows.

(See Scrapers.)

Portable Track.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.

Pottery Machinery.

American Clay Machinery Co.
Baird Machinery & Mfg. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

Powder.

Dupont, E. I. & DeNemours Co.

Power Plant Equipment.

American Clay Machinery Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Presses.

(See Brick Machines, also Sewer Pipe Machinery, also Roofing Tile Machinery.)

Pug Mills.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Mueller Bros.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Pulleys.

(See Supplies.)

Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Fate Co., The J. D.
Taplin-Rice-Clerkin Co.

Pumps.

Ceramic Supply & Con. Co.
Dean Bros. Steam Pump Wks.
Potts & Co., C. & A.

Pyrometers.

Brown Instrument Co.
Ceramic Supply & Con. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co., The

Rails and Railway Equipment.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Ceramic Supply & Con. Co.
Dewey Bros.
Fate Co., The J. D.
Lakewood Engineering Co.

Rattlers (Paving Brick).

American Clay Machinery Co.
Ceramic Supply & Con. Co.
Freese & Co., E. M.
Hetherington & Berner.
Phillips & McLaren Co.

Represses.

American Clay Machinery Co.
Bonnot Co., The
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Taplin-Rice-Clerkin Co.

Revolution Indicators.

Brown Instrument Co.
Ceramic Supply & Con. Co.

Revolving Steam Shovels.

American Clay Machinery Co.
Thew Automatic Shovel Co.

(Continued on page 513.)

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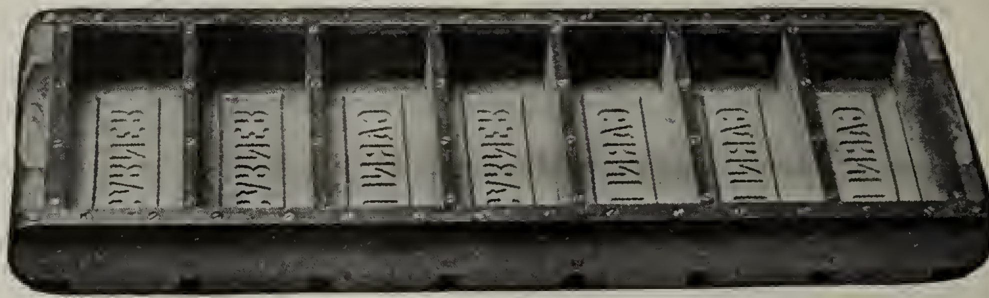

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American Clay Machinery Co.
American Pulverizer Co.
Phillips & McLaren Co.

Roofing Tile Machinery.

American Clay Machinery Co.
Fate Co., The J. D.
International Clay Mach. Co.
Mueller Bros.
Taplin-Rice-Clerkin Co.

Rope.

(See Supplies.)

Rotary Dryers.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Fate Co., The J. D.
International Clay Mach. Co.
Potts & Co., C. & A.

Sand Dryer and Sand Sieves.

American Clay Machinery Co.
Ceramic Supply & Con. Co.

Sand Lime Brick Machinery.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
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Lakewood Engineering Co.

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Illinois University.
Iowa State College.
New Jersey State School.
New York State School.
Ohio State University.

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Arbuckle & Co.
Eagle Iron Works.

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American Clay Machinery Co.
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Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Dunlap Mfg. Co.
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International Clay Mach. Co.
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Steam Gauges.

(See Supplies.)

Steam Shovels.

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Steam Specialties.

American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

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Frost Mfg. Co.
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Steel Pallets.

Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.

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Atlas Car & Mfg. Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Ceramic Supply & Con. Co.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
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Eastern Brick Machinery Co.
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Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
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Steele & Sons.
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Wallace Mfg. Co.

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Lakewood Engineering Co.

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Carnell, Geo.
International Clay Mach. Co.

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Brown Instrument Co.
Ceramic Supply & Engr. Co.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co.

Tile Machines.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., H.
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Fate Co., The J. D.
Freese & Co., E. M.
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Wallace Mfg. Co.
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(See Rails.)

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Turn Tables.

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Voltmeters.

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(See Supplies.)

Wheelbarrows.

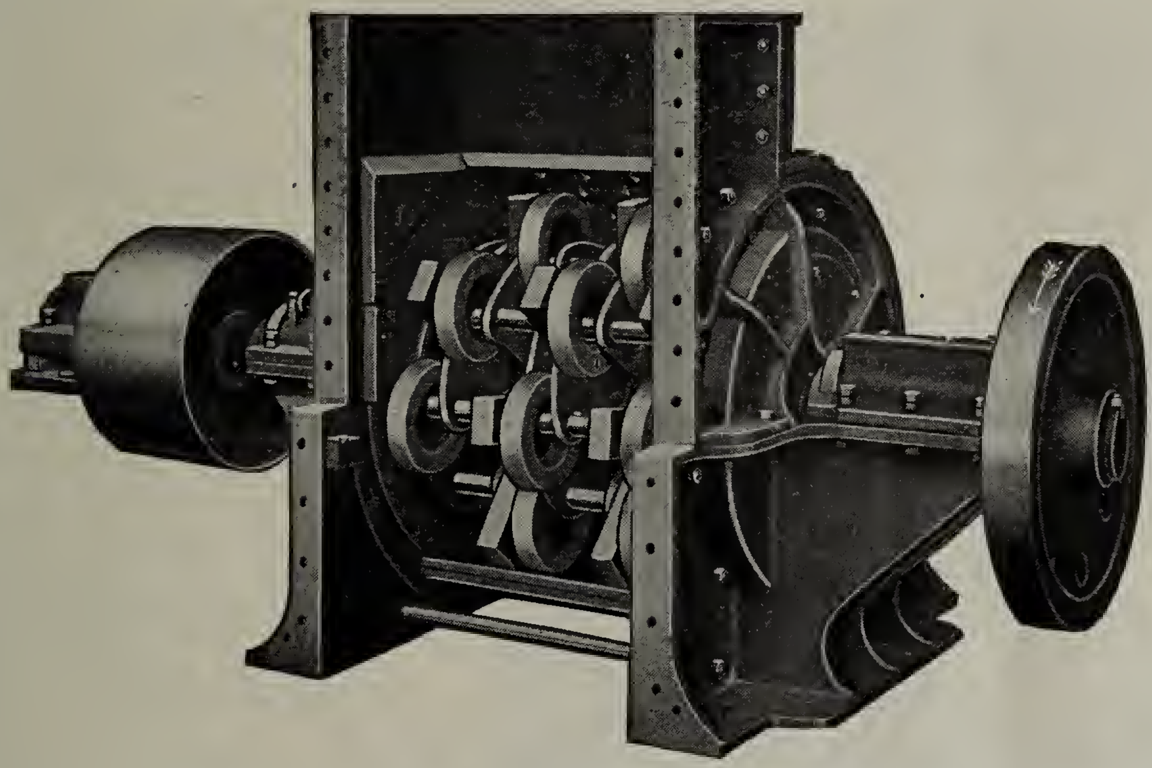
(See Barrows.)

Wet Pans.

(See Pans.)

Wire.

(See Cutting Wire.)



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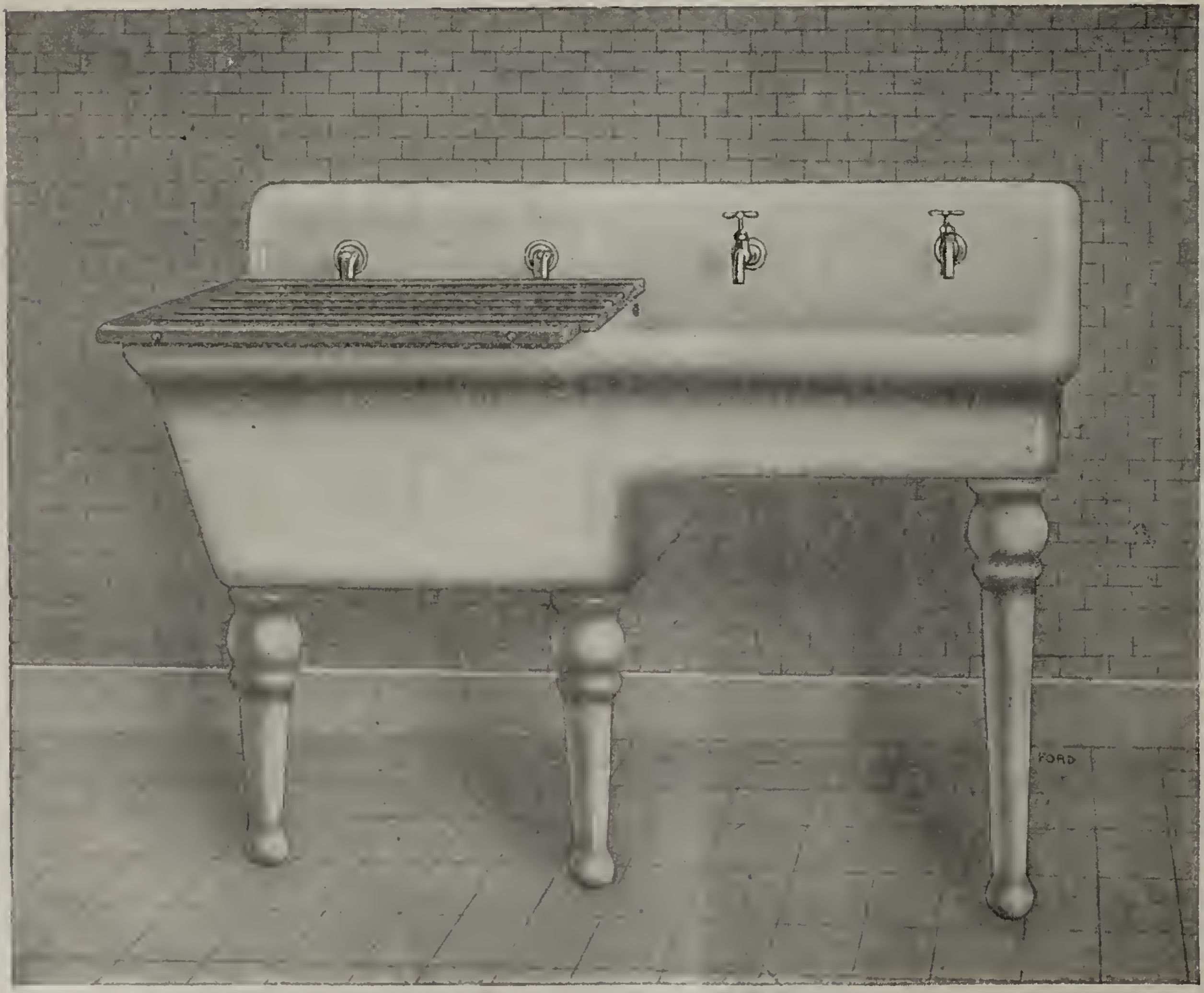

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A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

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The block with experience and service behind it. For 29 years the product of the present company has given satisfaction. We are the oldest paving brick manufacturers in Ohio west of the Ohio River.
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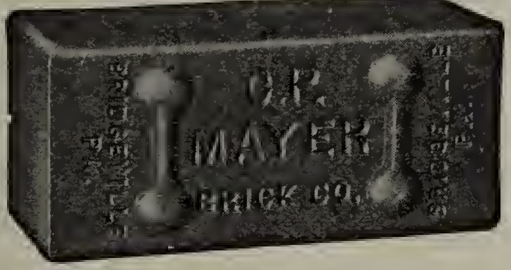

The Mayer Block is guaranteed to be free from all lamination, and the company will contract for delivery on a 20% abrasion test, or better, if necessary.

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Brick, Fireproofing, plain and ornamental Hollow Ware Dies, for auger or steam press. Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

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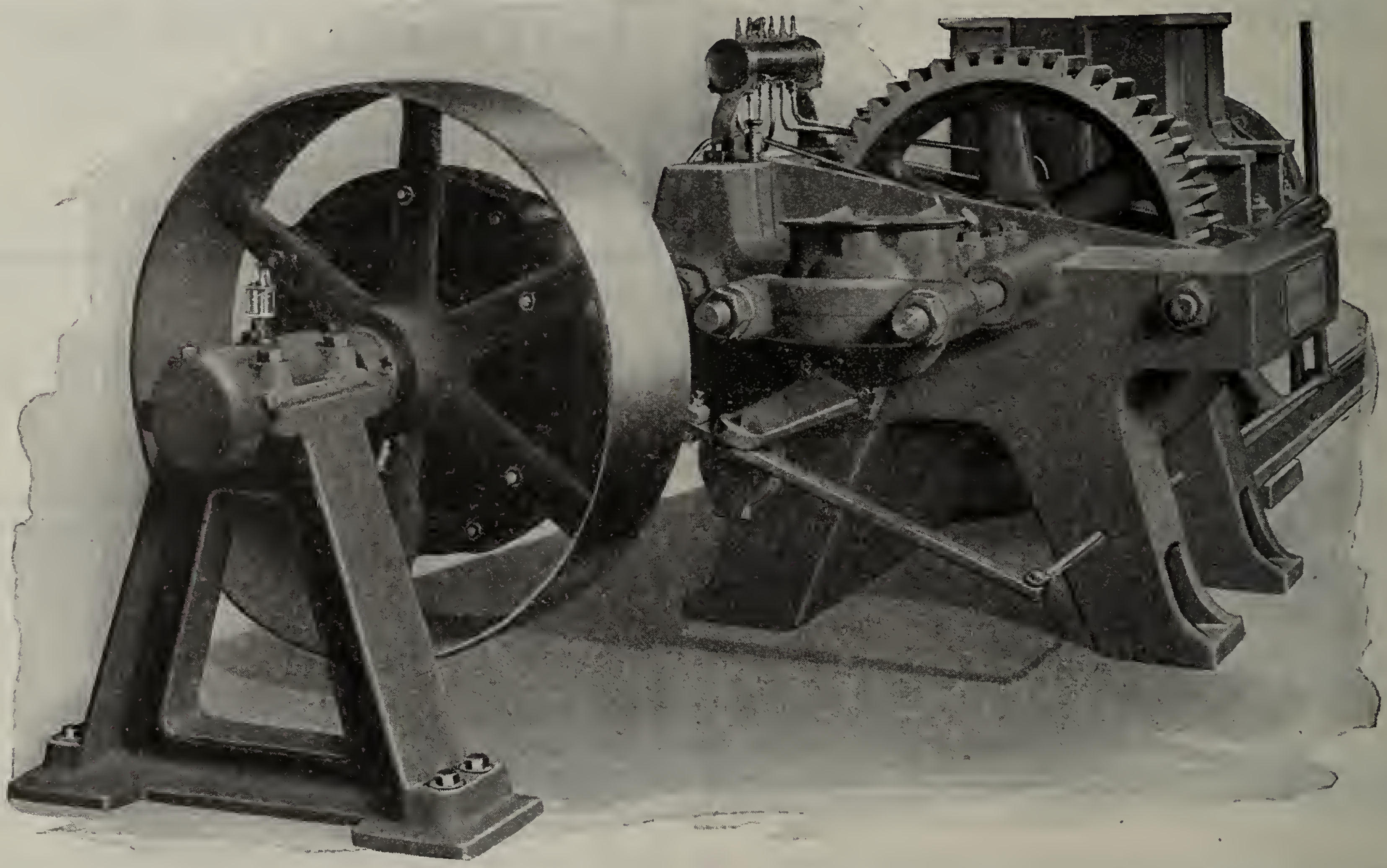

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The machine has our oil lubricated die, with appliance for securing a forced lubrication of the clay bar.

The loss incurred during the rattler test and the consequent rating of a block is the result of several contributing factors. It is not often that one thing alone makes or breaks a rating. So far as the machine is concerned

All of the Good Factors Are in the ROYAL

CHAMBERS BROTHERS CO., Philadelphia, Pa.

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Clayworking Machinery Developed
Through a Careful Consideration of the Criticisms of
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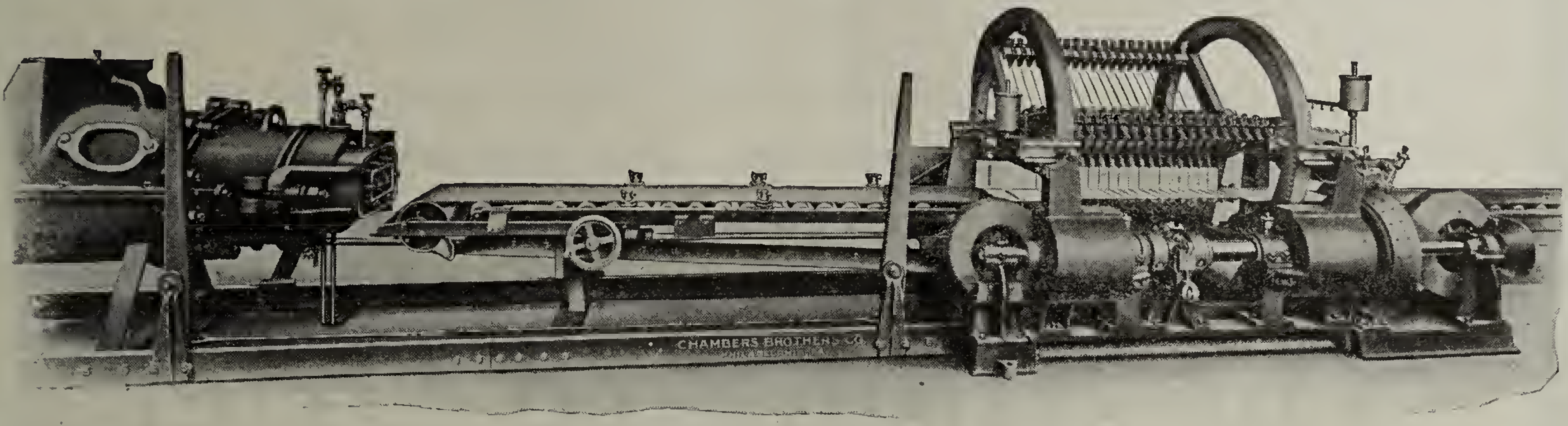

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Built so far as possible, to a standard for the construction of machinery of this class.

El Paso Brick Company

Pass-Tex Brick

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(Signed) E. Hewitt Rodgers, Sec'y.

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A 30-Year Success

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. LXVI. INDIANAPOLIS, DECEMBER, 1916. No. 6

Written for The Clay-Worker.

BUILD WITH BRICK.

A Boosting Campaign That Proved of Great Value to the Building Brick Industry.

EFFECTS OF THE COMPLETE BUILDING SHOW upon brick construction in Cleveland, its suburbs and near vicinity are every day manifesting themselves. In spite of the fact that newspapers have created a false impression of material selling at "war prices," with the resulting tendency to hold off till next year on the part of many prospective builders, brick construction has shown a gain of about 100 per cent. from last year, which was a record year in Cleveland.

One of the most favorable signs in connection with the favorable showing made by brick is the rapidly increasing number of brick buildings, which have been built to sell, rather than by the owners themselves. At least one company has been organized to build nothing but brick homes. This indicates conclusively that the "Build With Brick" idea has reached the builder.

This probably is the greatest accomplishment the brickmakers and dealers could have made, as 75 per cent. of the homes and a large percentage of the commercial buildings are erected by speculative builders. These operators are a shrewd group, and the fact that they build of brick indicates that the demand for this type of construction is keen on the part of the buying public.

If further evidence of the interest in brick were needed it is but necessary to call attention to the fact that more than 10,000 copies of "Brick Homes at Low Cost" have been distributed in Ohio and adjoining states, as a result of the interest roused at the Building Show in Cleveland last winter.

The distribution at cost of complete plans and specifications of the homes shown in this book has proven itself an invaluable means of creating in the minds of prospective home-builders a desire for brick construction. This is a plan which the lumbermen long have had in operation and is one the merit of which has been proven beyond question.

A set of these plans should be in the office of every brickmaker and dealer in the country. They are the only present means of combating the activities of the lumbermen, who have placed literally hundreds of thousands of plans for homes of wood with contractors and dealers.

A Substantial Brick Residence Erected in Cleveland, the First Cost of Which Was Little, If Any, More than a Similar Frame House.

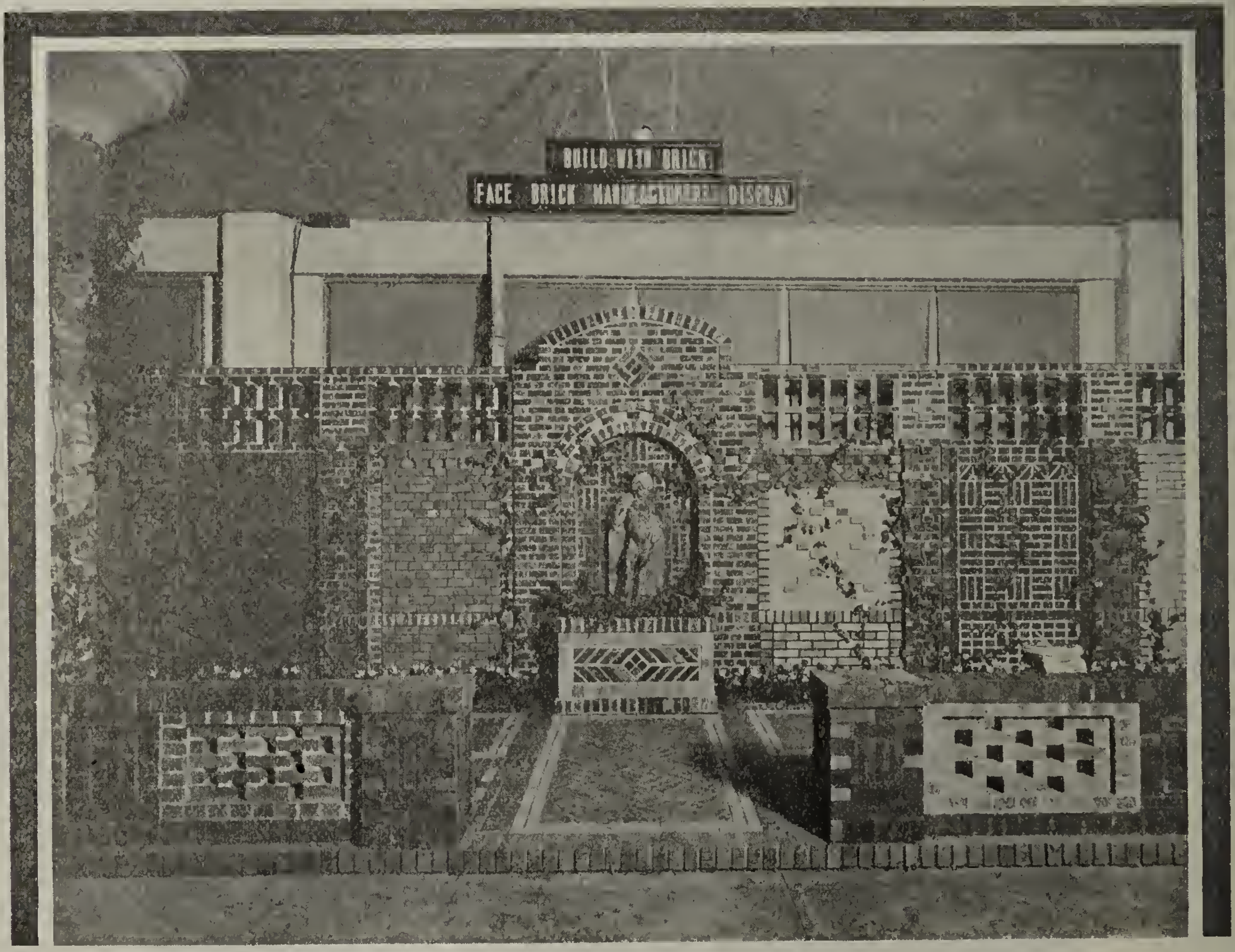
One of the most startling developments of the "Build With Brick" movement in Cleveland is the success of the Brick Homes Company in proving conclusively that homes of this type can be built to compete in price with the speculative frame affairs. During the past year this company has erected six buildings. Four of these are illustrated in the accompanying cuts. Considerable variety in designs and materials purposely was practiced in order that data regarding the various types might be obtained. All these houses were built upon lots costing $1,000 each. The average price of frame houses built in this same allotment was found to be $4,900, so it was the object of the officials of the Brick Homes Company to keep to this level. In this they were successful.

They built and sold homes of brick at the same prices asked and obtained for burnable houses of frame.

Proof that the educational work done by the brickmakers, who combined to boost their product in the Complete Building Show, was profitable, is given in the fact these houses all were sold before completion. Better evidence of the demand for brick homes could not reasonably be expected.

In the face of this exceptional showing, the old argument of "brick homes cost too much to build" is given the lie. Also the way is opened for builders in any section of the country to enter the "safe" building field without risk and with an assurance of a ready sale for their wares.

Dealers and makers selling in the Cleveland district claim what has been done there can be done anywhere, and without difficulty. The distribution of the "Brick Homes at Low Cost" books among builders and prospective home owners and the having on file of a set of the working plans and specifications in any dealer's office, where they may be inspected, is certain to result in the sale of enough brick to pay for them many times over.



Display of Face Brick at the Cleveland Complete Home Show that Made a Very Favorable Impression.

Dealers and makers in the East are to be given an opportunity to do for themselves what the Ohio manufacturers did in the northern Ohio district last year. In March of 1917 a building show on a national scale is to be held in Grand Central Palace, New York City. It is backed by those who initiated the Cleveland show, and it will be conducted on the same high order of that immensely successful exposition. In addition, it will have the advantage of being in the world's metropolis—in a field ten times the size, where the possibilities of returns likewise are ten times those offered in Cleveland.

The lumber manufacturers and dealers have been quick to seize the opportunity. Practically all of the lumber associations which exhibited at the Cleveland show have reserved space at the New York exhibit, and are planning even more comprehensive displays than in the sixth city.

As in the Cleveland show, community exhibits will be to the fore. Manufacturers of the different kinds of lumber will combine, instead of maintaining individual displays. It is likely the metal lath makers will participate jointly and in a big way, as will the cement makers.

The brickmakers as yet have not definitely arranged to participate, but a committee of them are at work upon the project and a decision is expected in a short time.

ARCHITECTS AND BURNED CLAY.

WOOD, STONE, CEMENT, all have served their purposes in building, but the time has passed when they are any longer economical. Time was when wood for the erection of buildings could be obtained almost for the cutting, but now it is very expensive, and supplies are so much reduced that exhaustion is feared by far-seeing men and they are earnestly advocating the use of some other material.

It is quite unnecessary to point to the yearly destruction of wood buildings by fire. The element of danger deserves more consideration than it gets, while the actual outlay in insurance premiums would make a difference in the interest upon the money needed to pay for safer construction.

Next came the age of stone, when all pretentious buildings were constructed of it—substantial, as ornate as the builder cared to pay for, yet suffering from certain inherent faults which made stone construction more or less a gamble and gradually led to superseding it with something else.

Artificial stone, or cement, came next, and there was devised something which was worthy a better fate. But unscrupulous builders took advantage of the ignorance of the general public and undertook construction with improperly compounded mixtures, and disasters followed each other so fast that cement, despite the publicity bureau it maintains, has lost its popularity and is seldom used, excepting in combination where its undesirable qualities have no chance to show themselves or develop dangers from which innocent persons usually suffer.

Now they are all swinging back to the old reliable burned clay. No matter whether in the form of brick of various sorts or in handsomely designed architectural terra cotta, it is always good, always safe, and so completely fireproof that it doesn't do any of the expensive things which are more or less certain to happen if the other three building materials are used.

Burned clay is the best of them all, because it never fails under the effect of heat and it is fireproof from within and without. A brick building will withstand a fire, no matter whether it is assailed from without by some structure burning near it, or whether it is from within, its own contents furnishing the fuel for the flames. While these statements are strong, they are accurate, and frequent demonstration has proved their truthfulness.

Architects are recognizing this more and more each day, with the result that where they are permitted any choice—and the instances increase—they almost invariably select some form of burned clay, either one of the many very handsome fabric faced brick or handsomely designed and colored architectural terra cotta, which surpasses any other material in beauty of finish and decreased cost of handling.

Proof of this is discoverable in any locality where much building is going on. Some dwellings are still made of wood, but in most communities of any considerable size wood is eliminated by the fire regulations and need not be considered as a structural material for houses of any pretensions. Its day has passed; and with it are going all the others whose utility, for one reason or another, is questionable.

The propaganda for brick is increasing so rapidly that the others are unable to keep pace with it and are wondering which way they shall turn in order to maintain their position. But they are quite unable to do it, and must, perforce, see their materials relegated to the scrap heap while burned clay comes into its own. The one material which has stood the ravages of time since Babylon deserves the strongest praise of its friends. They do not need to apologize. Their position is impregnable. They can rest assured that any structure they erect with burned clay now, whatever its form, will remain a monument to their foresight until they are forgotten. It is well sometimes to briefly review the actual tendencies, and overcome, if that is possible, the pessimistic ideas which seem to gain a foothold in some unexplained way in the minds of many leading men in the trade. Brick deserves to be used in all sorts of building construction, and when it is thus used it invariably demonstrates its superiority and helps to form a building whose life is practically endless.

SEEN IN NEW JERSEY.

Perth Amboy plants are endeavoring to keep up their deliveries, regardless of the fact that labor is so scarce their plants can be operated only to partial capacity. Just at present they are not hurrying the delivery of anything excepting what is actually on order, but they are looking forward to the time when they will be in position to do better. Demand has fallen off a trifle, perhaps, but it is still sufficient to keep the plants running to as near capacity as they can under present conditions.

They are closing a good year. Sales have been active all the season and prices have ruled high. Nothing in sight indicates any reduction of business in the year to come. Indeed, it is quite the opposite, since they anticipate even more business in the year to come than they have enjoyed this year. They say that the number of buildings projected indicates no cessation in business.

Makers in the Hackensack district have their last burnings in the kiln. They were especially favored with good weather through October and November this year, and were able to do better business until the close of the month, when they usually are forced to quit some time early in November. They are now getting their last burning ready for shipment. Even this will not be left when all the orders received late are filled. The Hackensack district will be virtually bare of stock for early delivery or to supply any demand which may develop in the winter.

A good deal of export business has developed, and business promises even better in this division of trade. Inquiries from South America are increasing and conditions point to inquiries from Europe and sales there in the near future.

This Exhibit Did Much to "Put Over" Brick at the Building Show in Cleveland.

THE CERAMIST'S CORNER.

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we give a continuation of the paper published by the Bureau of Standards, the first part of which appeared in November.

PROPERTIES OF SOME EUROPEAN PLASTIC FIRE CLAYS.

4. Composition (Continued).

For the purpose of establishing fairly well defined, fixed softening points which permit us to compare the refractoriness of the various clays, the well-known system of pyrometric cones was established by Seger. Pure clay, kaolinite, corresponding to the chemical formula $Al_2O_3.2\ SiO_2.2\ H_2O$, softens at cone No. 35, or approximately at the melting point of platinum, 1755° C. This point represents the highest type of refractory clay possible. The good fire clays, then, may range in refractoriness down to cone No. 28. The intervening numbers approximate the following temperatures: No. 34, 1740° C; No. 33, 1720°; No. 32, 1705°; No. 31, 1685°; No. 30, 1670°; No. 29, 1650°; No. 28, 1635°. These temperatures are only approximations, in the nature of the case, and it would be very desirable, indeed, if the use of temperatures in degrees were dispensed with entirely and the softening points indicated by means of the cone numbers. This would be a far more satisfactory and less confusing practice.

The ultimate softening temperature is apt to be a misleading criterion as regards the practical usefulness of a refractory, and in ceramic literature too much stress is placed upon this point. Thus, based upon the Seger kaolin-silica fusion curve siliceous clays are considered of an inferior grade compared with the high clay materials. As a matter of fact, clays high in silica and low in fluxes may show excellent refractory qualities in practical use and may stand up under severe conditions, as in gas benches and similar installations. The fact that the siliceous clays may fuse at a lower temperature, say at cone 30 or 31, is not of much practical significance. Such materials possess the important advantage of not softening throughout a considerable temperature range, as is the case with the clays approaching the composition of the pure clay substance and usually stand up at heats close to their ultimate softening point. The practice, for instance, of rating the siliceous New Jersey clays, which are low in fluxes, as second grade refractories must, therefore, be condemned.

III. DESCRIPTION OF WORK.

1. Materials Studied.

As has been stated in the introduction of this paper, the object of this work is the study of typical European plastic fire clays which have been found to fulfill the requirements of industrial practice by many years' experience, so that the information might serve as a basis of comparison for similar American materials. Through the courtesy and co-operation of the Findlay Clay Pot Company, of Washington, Pa., a number of 500-pound samples were secured just prior to the outbreak of the European war, which were made available for this study.

The materials selected for this study were as follows:

(a) A plastic clay from Gross Almerode, Germany, famous for its satisfactory behavior as a glass-pot material.

(b) A very plastic clay from Klingenberg, Bavaria, generally used in the manufacture of graphite crucibles.

(c) A plastic clay from the Kaschkau-Mehrener Tonwerke, near Meissen, Saxony, Germany.

(d) A plastic pot clay from St. Loupe, France, which is extensively used in the French glass industry.

(e) A plastic clay from the Westerwald district, Germany, obtained from Breitscheid, Dillkreis. This is a clay supposed to possess excellent qualities as a glass refractory.

Gross Almerode Clay.—This material is probably the best known of the plastic pot clays and was imported to the United States in considerable quantities. Ries gives the following data concerning it. The chemical analyses of the clays from this region of Hesse-Nassau correspond to the following compositions:

	Crucible clay Per cent.	Glass-pot clay Per cent.
Silica	47.50	72.05
Alumina	34.37	18.93
Ferric oxide	1.24	1.77
Lime	...	0.10
Magnesia	1.00	....
Potash	...	1.02
Loss on ignition	14.43	6.13

"These clays are found in the tertiary formation and possess the property of burning dense at a comparatively low temperature. The pot clay requires 25.80 per cent. of water for working, has an air shrinkage of 6 per cent. and a tensile strength of 180 to 203 pounds per square inch. Its softening point corresponds to cone 27. It burns steel hard at cone 03 and assumes a very dense structure at cone 3."

Another authority gives two chemical analyses, of which No. 1 represents the bulk of the Gross Almerode deposit and No. 2 the best known clay:

	No. 1 Per cent.	No. 2 Per cent.
Silica	65.98	46.37
Alumina	23.37	35.62
Ferric oxide	2.32	2.25
Lime	.41)	
Magnesia	.53)	.88
Potash	.76	1.80
Loss on ignition	6.84	12.98

The clay being actually used in this country is evidently the more silicious material rather than that higher in clay substance.

Klingenberg Clay.—This material is especially favored for the manufacture of graphite crucibles and up to the present time has been used exclusively for this purpose by American makers. The best selection mentioned in the literature is said to approach closely the following composition:

	Per cent.
Silica	54.06
Alumina	33.11
Ferric oxide	1.50
Lime	.49
Magnesia	.45
Potash and soda	1.37
Loss on ignition	9.12

The clay is mined near Klingenberg, Bavaria, and is one of the most plastic clays known. It appears to be quite high in organic matter. Unmixed with non-plastic matter, it has a decided tendency to check and crack in drying. There are several grades of this clay on the market, which differ in refractoriness.

Kaschkau-Mehren Clay.—This material is mined near Meissen, Saxony, and has the reputation of being a satisfactory plastic bond clay. It is the decomposition product of a porphyry. Seger gives as the composition of a typical plastic clay from this district the following figures:

	Per cent.
Silica	63.17
Alumina	25.09

Ferric oxide	.64
Lime	.35
Magnesia	.26
Potash	.80
Chemical water	9.70
Clay substance	67.82
Quartz	30.93
Feldspar	1.25

Clay from St. Loupe.—In France refractory clays are found in the Paris basin, in the Departement de la Marne, in the Bernon mountains, and near Bollene or Noyeres. Attention might be called also to the excellent fire clays found near the boundary line between France and Belgium, such as the famous clay from Andenne, near Namur, and the pot clays from Navelin, Strud-Maiseroul, Ohey-Matagne, Tahier, and Soree. The most plastic and refractory material is that from Strud-Maiseroul. An analysis of the Ardennes clay is given by Ries as follows:

	Per cent.
Silica	49.64
Alumina	34.78
Lime	.68
Magnesia	.41
Ferric oxide	1.80
Alkalies	.71
Loss on ignition	12.10
Total	100.12

Westerwald Clay.—This clay comes from one of the extensive deposits in Hesse-Nassau, associated with lignite beds, and which extend into the valley of the Rhine. Well-known deposits are found at Hoehr, Grenzhausen, Ebernhahn, Wirzes, Giroden, Limburg, Vallender, Breitscheid, and many other localities. The sample available was from Breitscheid (Dillkreis). The Westerwald clays show a wide range of compositions and vary from the siliceous stoneware clays of Hoehr to the purer clays of Vallendar, in the Coblentz district, on the east side of the Rhine valley.

2. Tests Made.

With reference to the properties of the clays in the raw state, both plastic and dry, determinations were made of the amount of water required for normal consistency, the relation between different water contents of the same clay and the drying shrinkages, of the Atterberg plasticity factor, of the fineness, the tensile strength in the plastic state, the time of disintegration in water, the tensile and transverse strength in the dried state, both without and with admixture of nonplastic, and an estimate of the drying behavior.

As regards the properties of the materials upon firing, the absorption and the porosity were determined for each clay when heated to a series of temperatures as well as the apparent specific gravity and the final softening temperature.

3. Water Content and Drying Shrinkage.

The clays were made up with percentages of water, varying from the amount required to cause minimum plasticity or working quality to that in which the materials had become soft and had reached the upper limit. The linear drying shrinkage was determined in each case. This work included, of course, the determination of the water content at normal consistency and the drying shrinkage both at room temperature and in a constant temperature oven at 65 degrees C. The water content in each case was determined by drying at 110 degrees C. in an electrically heated oven.

The Atterberg plasticity number was obtained as described by Kinnison.

The estimation of fineness consisted in determining the percentage of clay removed in the elutriation test by a water current of 0.18 mm. per second. The Schoene funnel was employed for this purpose. In order to secure satisfactory results it was necessary to deflocculate the clays either by using 0.1 per cent. of caustic soda in terms of the dry weight of the clay and slaking the 5-gram sample with 100 cc. of distilled water, or to use an alkaline solution throughout the washing process, possessing a strength of 0.01 per cent. caustic soda. A fine screen was inserted in the lower part of the funnel, as recommended by Seger. The temperature of the water was kept very close to 21.5 degrees C. The amount of clay removed by washing was determined by weighing the residue left in the funnel.

The time of disintegration in water was determined by making seven-eighths-inch cubes of a 1:1 mixture of the clay and potter's flint thoroughly mixed together, drying the cubes at 110 degrees C. and then immersing them in water at room temperature. During the immersion the cubes were placed on coarse mesh wire baskets suspended in the liquid.

4. Mechanical Strength of the Clays.

The tensile strength of the clay specimens, possessing the shape of the standard cement briquette, was readily determined by using one-half of the brass mold as the top clip and as the lower one a clip made from plaster of paris, which was shellacked. The load was gradually applied by causing a small stream of water to flow into a light pail. The stream was interrupted automatically as the specimen broke. Failure in each case was preceded by rupture cracks and elongation.

The tensile strength in the dry state was determined as usual, employing specimens of the form of cement briquettes. The bars for the transverse test were pressed in brass molds and were of the dimensions 6½ by 1 by 1 inch in the green state. All specimens subjected to these tests were first dried at room temperature until shrinkage had ceased, then to constant weight at 75 degrees C., and the drying completed at 110 degrees C., a practice recommended by C. H. Kerr.

Since plastic clays are subject to strains in drying which may lead to the formation of visible or invisible cracks, and hence to abnormal results in the tests, such determinations made upon unmixed clays must be looked upon with caution. Even very strong clays may give poor results because of drying defects. It would be desirable if a uniform practice of using a 1:1 mixture of the clay and a standard sand could be adopted, since this procedure would do away with the difficulty mentioned. In the present work, in addition to the tests of the unmixed clays, mixtures of the clays with grog, produced by calcining a high-grade flint clay, in the proportion of 1:1, by weight, were employed. This grog was obtained through the courtesy of the Harbison-Walker Refractories Company, Pittsburg, and showed the following sieve analysis:

	Per cent.
Grains between 10 and 20-mesh sieve	0.1
Grains between 20 and 30-mesh sieve	13.9
Grains between 30 and 40-mesh sieve	19.9
Grains between 40 and 60-mesh sieve	16.2
Grains between 60 and 80-mesh sieve	5.6
Grains between 80 and 100-mesh sieve	5.5
Grains between 100 and 120-mesh sieve	8.1
Grains between 120 and 150-mesh sieve	2.5
Through between 150-mesh sieve	26.6

A sufficiently large amount of this grog was available to serve for all of the tests. It is evident, of course, that calcined clay of another combination of sizings would give somewhat different results.

5. Drying Behavior.

The drying qualities of the clays were estimated by measuring the linear shrinkage and by determining the length of time elapsing before shrinkage ceased, the drying being conducted in an electrically heated oven maintained at a constant temperature of 65 degrees C. Multiplication of the percentage of linear shrinkage by the time in hours elapsing until complete shrinkage has taken place, results in a factor indicative of the resistance of the clay to drying and the value, hence expresses the difficulty experienced in taking it through this process.

(To be continued.)

DEDICATION OF THE CERAMIC BUILDING, UNIVERSITY OF ILLINOIS.

An Interesting Ceremony in Which Several of the Noted Ceramists of the Country Participated Marking a New Era for the Clayworking Industries

THOSE who missed the dedication ceremonies of the beautiful ceramic building of the University of Illinois, December 6 and 7, deprived themselves of an intellectual feast seldom their good fortune to enjoy. The program was most elaborate, and each and every number was handled by men of such wide reputation and well-known ability that there was not a dull moment in the entire celebration.

Meeting of Advisory Board.

At 1:30 Wednesday afternoon, December 6, there was a meeting of the advisory board of the department of ceramic engineering, consisting of the following gentlemen: F. W. Butterworth, chairman, Danville, Ill.; A. W. Gates, Monmouth, Ill.; W. D. Gates, Chicago, Ill.; J. W. Stipes, Champaign, Ill., and Eben Rodgers, Alton, Ill. A resolution was presented and voted upon favorably which enlarged the advisory committee so that it represented all branches of the ceramic industry, including cement, gypsum, etc. A resolution favoring the extension of the department into the glass, cement, gypsum and the decorative and artistic branches of ceramics was passed.

From 2:30 to 4:30 p. m., Wednesday, the opportunity was given to all friends of the University to inspect the new building and its laboratories. Much comment was made upon the attractiveness of the beautiful halls of the building, walled with handsome brick panels furnished by various face brick manufacturers and tiled with the miniature floor tile of the Trenton (N. J.) Tile Company. Every detail about the building is perfection itself and the whole combines to form the finest and best appointed ceramic building in the world. Space will not permit a detailed description; suffice to say that an illustrated booklet describing the department of ceramic engineering, its organization, purposes and equipment, was published by the University for distribution at the dedicaton exercises. If you did not receive a copy, you can secure same by writing the Ceramic Department of the University of Illinois, Urbana, Ill.

Wednesday evening an introductory session was held at the University Auditorium, President Edmund J. James presiding. There was a brief organ recital, followed by two addresses, the first on "The Ceramic Resources of America," by Dr. S. W. Stratton, director of the National Bureau of Standards, Washington, D. C., and the second by J. P. Beck, general manager of the Portland Cement Association, on the subject, "Science as an Agency in the Development of the Portland Cement Industries." Dr. Stratton dealt with his subject in a most interesting, non-technical way, discussing the organization and formation of the different types of clay deposits, together with their most prominent geological and geographical positions in the United States, the reactions occurring during the burning of clay products, and the classification of the various clay products fashioned from ceramic material. The whole address gave a very clear idea of the great variety and extent of the clay resources of the nation and the multifold products which are manufactured from them. The address of Mr. Beck was characteristic of the talks generally delivered by the cement advocates. It was interesting and instructive.

Thursday, December 7, a technical session was held, Dr. E. W. Washburn, professor of ceramic chemistry and head of the department of ceramic engineering, presiding. The first speaker was Mr. W. D. Gates, president of the American Terra Cotta and Ceramic Company, Chicago. His subject was "The Manufacturer's Dependence Upon Ceramic Research." It was one of the best addresses he ever delivered and was thoroughly enjoyed by the large audience. Mr. Gates has been one of the active workers in creating the ceramic department of the University of Illinois and in promoting its welfare, being a member of the advisory board of the department of ceramic engineering. His address is published in full.

Main Entrance Ceramic Building, Urbana, Ill.

THE MANUFACTURERS' DEPENDENCE ON CERAMIC RESEARCH.

BY W. D. GATES.

All things in all times change. It is the law, the established order of things. Progression, speeding up, higher achievement, better wares and better service are strictly and rigidly demanded in each and every line of work. He who does not heed, who holds that what was good enough for his father is good enough for him, will be distanced, cast out, and left behind in the intense rush of the business life of today. It is absolutely the survival of the fittest.

From the days of the Cave Man, in the matter of maintaining personal rights, the bare fists gave way to the war club, that to the flint arrow, to the flint musket, to the breech loader, the machine gun, and the mammoth cannon of today. Man grew from killing retail to killing wholesale. From killing closely by personal touch to killing at twenty miles men that he could not see and that could not see him. He condensed mighty gases into compact form that he might suddenly loosen them with all their terrific power for his use, to do his bidding, to work his venegeance. He learned to govern them absolutely, to bind more power into a smaller package. When their smoke bothered him he stopped their smoking and made smokeless powder, so that the men he fought could not locate his hidden retreat. Man is like all animals in that he fights but unlike any animal in that he laughs, and this trait of his leads him to other things than war and slaughter.

Thank God not all his conquests are by war. There are other ways than by blood, others than by physical force. Chemistry can work out other things than high explosives, things useful and beneficent, rather than destructive and abhorent. Mechanical and Chemical Arts have been advanced far beyond the fondest dreams of our fathers. Man talks across the ocean, travels under it, flies in the air; from using the lightning as a plaything he makes it his servant and commands its mighty power, binding and harnessing it to do his bidding, even before he really knows just what it is. He hunts out its laws and, knowing them, compels it to do his will. Utilizing the force of gravity in our lakes and rivers, he has harnessed that power and, compelling it to make lightning, has lit up his cities with it and turned night to day with water. What would your grandfather have thought of the statement that the waters of Lake Michigan would eventually light the city of Chicago? Jules Verne's dream is no longer a dream and ships go under the water. Darius Green and his flying machine are no longer a joke, for man flies at an hundred miles an hour, outstripping the birds, and not that only but he fights other men there. From the big things to the little, the invisible, man has made a new eye and sought out the little, invisible, teaming microscopic life; has hunted disease germs and, having found them, has fought them and conquered. Life has thus been prolonged and saved. The great doctrine of prevention has been established without which such great achievements as the Panama Canal could not have been accomplished.

Manufacture has always been dependent on research, from the time of the first manufacturer, and Ceramic Research is one of the oldest of all such lines employed. It was not a lack of research but of quality and extent and the effort and energy employed. Ceramists have always been enthusiasts, optimists in the extreme, dreamers. The very first experimenter when he, or more probably she, found she could shape a cup in a plastic mass of clay, hesitated not at all but proceeded at once in the attempt to make a better one, in which, every Ceramist since has followed her example. Nothing was so good that a better was not sought. Perfection was always sought but never acknowledged as achieved. Always a better body, better glaze, better shape and greater beauty were sought. Utility and beauty were the objects ever pursued. To make the best possible has been the effort and to this end all the workers have wrought tirelessly, enthusiastically and intelligently to the very best that was in them. Their effort was right but they had small opportunity. It was individual and not collective effort and the problems were too much for an individual, team work was required. At first there was no fund of research accumulated and it had to be hunted out, built up and made available. This necessity being apparent, this first discoverer of the fact that clay was plastic, could be fashioned, made into a cup that would hold water, did not stop. It was a memorable discovery but not final. The discoverer, having the true spirit of the potter, kept at it and made the further discovery that it would dry and harden. Undoubtedly the very next discovery was the disconcerting one that it would wet up and dissolve when wet again. Long research must have been exercised here to correct this which however resulted finally in utilizing the great mystery of fire to fix it lastingly. This changed its whole nature and made it indeed a new material, useful, beautiful and lasting. From the first experimenter on, through countless ages, beauty of form has been the objective. Utility was a pressing requisite, but effort to make it beautiful was always shown, and protected and preserved the article when made, causing it to be treasured. and cared for. I have no doubt but that the first discoverer in fashioning her cup, shaped its form to lines of beauty, possibly crude, but seeeking beauty none the less. Ceramic research had thus progressed to the forming of a cup, doubtless crude, probably porous, but a great achievement and prophetic of the future. Later on research brought out the quality of vitrification—non absorbent and water proof—and, later on, wedded the cup to glass and glazed it. This one thing of the glaze bound the Art irrevocably to close Ceramic Research and committed every succeeding potter to cast aside all else in the fervent, tireless, effort to surpass, to make a better body and a better glaze than any one before him had made, and, in his fervent, tireless, effort to surpass, and in his enthusiasm to this end, make any sacrifice, endure any privation,

Ceramic Building, Recently Dedicated, Illinois University, Urbana, Ill.

surmount any obstacle and never give up hope. Pallisy was not the only potter who burned furniture. All potters have done so: burned furniture, bridges, luxuries, clothes, necessities even, and today, all over the world, they are feeding their kilns with clothes and automobiles and sacrificing their luxuries and comfort, they are eating dry crusts instead of cake, that they may feed their kilns, try their experiments and make something better and more beautiful than has yet been wrought. All this has brought clay wares into a very extended use. You drink your morning coffee from a cup of clay, more than a thousand times a year you eat your food from a plate of clay, you wash your face in a clay bowl and you take your bath in a clay tub. All the modern use of electricity would fail were it not for clay insulators. The paper you write on and the paper on your wall are largely composed of it and even the sugar you put in your tea is more than likely to have made its acquaintance, but in the latter case not through Ceramic Research.

While the Ceramic Art is perhaps the most ancient of all the arts of today it has been probably, through the past ages, the most secretive. Progress in it has been, of necessity, by means of a multitude of experiments, mostly of necessity failures, being wrought so crudely and blindly. Occasionally one proves good and capable of reproduction. Many were freaks and depended on chance conditions which were not present on the next attempt and were therefore discontinued and lost. Sometimes, however, these were traced out and led to new processes, thus utilizing these very accidents. When these processes stood the tests and produced a new effect, the process was surrounded by every possible safeguard to hold it secret. Often so closely guarded that it was lost on the death of the discoverer. Often too it was handed down, from father to son, as a family heirloom, thus remaining in use for generations. Imitation, however, prevailed more than invention. Men feigned idiocy to get into factories, living on crusts and being kicked and buffeted about, that they might finally worm out the secret and then go and imitate. Even where invention was used it was employed in a blind fashion, feeling the way with this and that material, and with very little real knowledge as to real possibilities. So earnest was the work, however, and so extensive the experimentation, that much of good was accomplished, and these experimenters are entitled to very great credit for having, under such conditions, wrought out methods many of which are used to this day.

W. D. Gates, Chicago, Ill.

But even the excessive secretiveness of the potter has had to yield to the modern spirit. Men have become broadminded enough to subserve their personal interests to the good of their Art; to add their contribution to that of the one who had gone before them and not only that but to hand over their contribution to the fellow coming after them, and thus get the whole, cumulative effect. They have learned to glory in the upbuilding of their Art as an Art indeed.

The Almighty has prepared the material in abundance. In the great laboratory of Nature He ground it with mighty glaciers, chemicallized it through countless ages, washed it, spread it out, compressed it under millions of tons pressure and covered it over deeply for man's use when required. Men have constantly labored and schemed with this crude material. They have dug deep but, as yet, have only scratched the surface. They have mixed one clay with another clay and have thus improved their wares by the mixing process. They have earnestly and faithfully sought to find out and follow Nature's Laws and have broadened from ancient usage radically in publishing their findings for the good of the Art and for the benefit of those coming after. The active work of the American Ceramic Society and the work done in the Ceramic Departments of our State Universities have done much and will yet accomplish wonders in the clay art in the future history of our country. The names of Orton and Bleininger will be spoken in reverence by the workers in clay in generations yet to come. The taking of a crude, waste material and making it into a thing of utility and beauty is indeed something of which to be proud. The digger of the clay, working with the pugger, the presser, the chemist, the modeller and the burner, all working earnestly and honestly, each giving the very best there is in him, will produce useful and beautiful wares, as yet undreamt of, out of this hidden, unused material that has so long been waiting under the prairies of Illinois. Lying crude and hidden the material does no one any good. He who fashioned it, Who so patiently prepared it and laid it away, left it lacking in admixture with one thing in particular—brains. Unless mixed with these it will never come into its own. The clays must be good and the brains must be good, and the mixture must be right. Both may be good but lack the mixture. In Italy, today, there is crude clay, still in the bank, from beside which other clay was dug five hundred years ago. That other clay, under the touch of Aela Robbia, grew into a beauty that has placed it, worth its weight in gold; yes, priceless; treasured in the choicest museums of the world, while this undug clay, untouched by a skilled hand, unmixed with brain, remains inert, despised, unused, awaiting the touch of another hand to bring it into the life, the individuality, that shall make of it a thing of beauty, shall fix into the vigor and enthusiasm of him who fashions it into lasting beauty. So there lies all under this State of Illinois a wealth of this crude material waiting the touch that shall give it life and beauty. I believe that the men who will do this are those that shall go out from this school with brain skilled and trained for that work, working, not blindly as of old, but with trained intelligence.

Ceramic research has largely to do with chemistry. The various admixtures are formed when the materials are cold but the chemical changes occur when heated to a high degree of heat and are hence shut out of sight. They also, necessarily, extend over quite a period of time. The experiment started today may require a week or a month or more. The intimate chemical changes that occur when the material is molten are very perplexing and intricate. To all the complexity of mixtures of flint and spar, of flux and frit, there is added that of color, for the production of which the ceramists pallette is extremely limited. A few metallic oxides only will withstand the heat and even these are of a most erratic nature, as instance copper, which is capable of making black, blue, green and red according to the atmosphere in which it is produced.

But ceramic research is not confined to chemistry. Engineering and general management enter largely into the field of this research. Large quantities of crude material must be handled, must be plentifully and economically provided and, to this end, there must be the most intelligent treatment. Machinery must be largely used and great intelligence exercised in its construction and employment. Men must be selected for the various places and as nothing varies more than men very great intelligence must be exercised in their selection and placing. The right man in the wrong place or the wrong man in the right place is as disastrous with men as with machines. So a properly balanced working plant for manufacture is really a complicated mechanism, and like any other complex piece of machinery, a bad cog in the wheel will throw the whole out of gear and stop all perfect working of the machine.

Beyond these generally recognized essentials of ceramic research there is another, often missed in the general summing up, but of the utmost importance, that of art. Unless it have artistic beauty, no matter how skillfully compounded, the product will be a failure. The primitive Indian woman, fashioning the first clay pot, forming it for ordinary domestic use, recognized this requirement, shaping it to pleasant form in lines of beauty. Having so formed the first she soon progressed to adding something of ornament by scratching an ornamental design in that universal, never ceasing, effort to add beauty to utility. This effort of the first worker has never stopped but has acquired momentum as the years passed. Beauty has been a protection as well. Many of the relics that tell us of the dead and buried past are very fragile, not the big heavy affairs, but delicate, breakable but beautiful things whose beauty appealed to all and for which they were prized and protected. I look forward confidently to the time this will be better recognized and when this university will have a distinct department, housed in the beautiful clay building, in this clay state, in which talented, enthusiastic artists will lead and teach eager pupils in modeling clay into lasting beauty. Illinois has, I am sure, undeveloped Della Robbias in plenty, and they only need encouragement and instruction to bring them out. If we can not do this work ourselves, if we have not the hand trained to the magic touch, if we have not the eye to see the hidden beauty in this crude material, if we can not materialize the hidden beauty ourselves, if we have not the brain nor the training required to bring out its beauty and fix it lastingly, for the good of mankind, we can still so arrange things that the tools are here for the good of others, so the way shall be open, all the material provided, building and instructors ready, the opportunity shall be afforded those coming after us to use facilities we did not have and, lacking these, we came to know their value.

There is a wide field of experimentation that really can not be done elsewhere than in a school such as this. Individuals have not the time to devote to it. It is broadly in the line of the advancement of the science, requires much time and careful attention, and would never be worked out except in such a school and by students who were building themselves up in the working out of just such problems. Instance of this is the formula for chrystaline glaze given the American Ceramic Society and the eighteen hundred experiments made in this school with it in which very much interest was added that never would have been worked out except under these conditions.

The manufacturers of Germany demonstrated their belief as to the value of such research and, utilizing it in every available form, they went conquering the world. They were indeed far on their way in such conquest up to the time that the war lords fell out and so stopped their work and dragged them back to the old, old aboriginal manifestation of brute force and the lust for blood. Had they but kept to their work, utilizing scientific research in their manufacture as they had been doing, their conquest of the world would seem to have been assured, but the war lords decided otherwise and chose the way of blood.

This gathering here today is not just an accident. Not something that happened without cause or reason. This gathering itself is a complete demonstration of the pressing importance and insistence of the subject of which I am speaking. You are gathered here today because of the persistent demand of the manufacturers for more ceramic research. They have not only clamored for it, they have worked for it, earnestly and self-denyingly. They have labored personally and collectively. This department of ceramic engineering came into being because of their demands and their effort. They labored with the university authorities; they worked with every succeeding legislative assembly; they begged appropriations, and then, rallying the clay-workers throughout the state, demanded appropriations, and they got appropriations. All this labor and effort has crystalized and materialized in tangible form in this building. We here dedicate today. Dedicate to the furtherance of our art. Dedicate for the good of those who are to come after us and who will, we know, surpass us. Dedicate that they may not lack the facilities that we lacked. Dedicate that they may grow to do the things that we could not do. Dedicate in reverence and hope as our best contributor to the progress and good of the work we love.

I have treated my subject in a wandering fashion, possibly in a wondering fashion, for the reason that the need of the manufacturers for ceramic research is, and always has been, so great, so well known, so constant and insistent as to be self-evident and needing no demonstration. This dependence has existed from the earliest times, the want has always been felt. What was needed was a proper opportunity for research. A place was needed and tools and then education in using the tools. Men must be educated to becoming skilled in knowing how to use material and tool; must be so trained that when reactions occur they must know why they occur and work intelligently to the desired end, and not blindly, as in the past. The quest has been, much of the time blindly, gropingly, in the dark, but now is coming to be openly, understandingly, and in broad daylight. State universities like this, and buildings and appliances like these, are the tools which shall furnish the opportunities and appliances, for the training of the brains to mix with the clays that will then place our art where it belongs, and our pioneer work shall not have been in vain.

I may only add that the men on this board who have really done the most in the pioneer labor to bring this work to fruition are so modest and diffident and fearful of receiving the praise they so well merit for their efforts that they are sitting very tight, keeping very quiet and following usage from time immemorial, are now putting forward that member of the board who probably did the very least in the real past work to now do the talking. (Loud applause.)

Mr. Ross C. Purdy, research engineer of the Norton Company, Worcester, Mass., and formerly head of the ceramic department at Illinois University, made a most interesting talk on the manufacture of grinding wheels in the Norton Company's plant. He was followed by L. E. Barringer, engineer of the insulations for the General Electric Company, Schenectady, N. Y., and the president of the American Ceramic Society. His talk was on the general tendency toward ceramic research and the importance of same, especially in electrical work. He told of the manufacture of electrical insulators at the Schenectady plant, and explained that their splendid development and that of the electric light and other electrical products were due to research work.

"The Use of Ceramic Materials in Highway Construction" was the subject of the address by W. W. Marr, chief state highway engineer, Springfield, Ill. It was an impartial talk on the relative merits of brick and concrete paving construction. This was followed by an informal talk by Mr. W. P. Blair, secretary of the National Paving Brick Manufacturers' Association, and a paper read by G. C. Wooley, engineer for the Road Bureau of the Portland Cement Association.

Mr. J. H. Burt, structural engineer, Chicago, Ill., read a splendidly prepared paper on "Ceramic Products as Structural Materials."' He emphasized the need of testing and the making of correct specifications.

Mr. A. V. Bleininger, head of the clay products laboratory of the U. S. Bureau of Standards, Pittsburg, and formerly head of the ceramic department of the University of Illinois, made an informal talk on testing of clays and other products and the need of same.

One of the most enjoyable addresses of the day was that of Mr. Claude Bragdon, author and architect, of Rochester, N. Y. The title of his address was "The Use of Ceramic Products in the Artistic Embellishment of Buildings." He decried the loss of color in architecture and urged the use of clay products in furnishing a new beauty for same. Mr. G. C. Mars, department of service of the Hydraulic Press Brick Company, St. Louis, gave a most interesting talk, citing the great possibilities of color scheme in the use of clay products. This finished the morning program. The speakers and many of the professors were given a luncheon at the University Club by the Dean and heads of the departments of the College of Engineering.

The session of dedication occurred Thursday afternoon, December 7. Dr. W. F. M. Goss, Dean of the College of Engineering, presided. After an invocation by Rev. C. R. Adams, President James made a short address on behalf of the state, in the absence of Gov. Edward F. Dunne. An address on behalf of the University was delivered by Mr. W. L. Abbott, president of the board of trustees. He reviewed the history of the University and detailed the progress made in the ceramic department.

Prof. Chas. F. Binns, director of the New York State School of Clayworking and Ceramics, Alfred, N. Y., delivered an address on the subject, "The History of the Ceramic Arts." This is one of the most valuable contributions to the literature on ceramic history ever made. The subject was thoroughly treated, in a most interesting and entertaining manner. The address will be found on another page of this issue.

The last address on the program was by Professor James, of the University of Illinois, on "The History and Importance of the Ceramic Department of Illinois." He reviewed the history of the department, eulogized Professor Rolfe for his persistent efforts in founding the department, and praised Professors Bleininger, Purdy and Stull for their great assistance. After President James' address the audience arose and sang "America." A line of procession was then formed, led by the University band, which played a splendid march on the way from the auditorium to the ceramic building, in front of which the large crowd, with bared heads, listened to the prayer of dedication by the Rev. J. M. Page.

Installation of the Illinois Student Branch of the American Ceramic Society.

Thursday evening a large crowd of ceramists met in one of the lecture rooms of the ceramic building. Some thirty-odd students and visitors greatly interested in the work were present. The old student society was abandoned and an Illinois student branch of the American Ceramic Society founded. L. E. Barringer, president of the American Ceramic Society, made an appropriate address and presented the newly formed society with its charter according to the rules of the main body.

All students present joined the new society. There are close to sixty ceramic students in attendance at the University, and it is fully expected that the great majority of these will become members of the organization. It is one of the splendid opportunities offered the young men for increasing their knowledge in ceramics.

Speeches were made by Professors Parmalee, Purdy, Binns and Bleininger, Dr. W. F. M. Goss, Dr. Washburn, and J. E. Randall, representing The Clay-Worker.

Immediately after these informal speeches all present walked to a fraternity house, where a smoker, including a feast of ginger cake, apples, cider, etc., was much enjoyed.

SOUTH AMERICA WANTS CHINAWARE.

We were developing a right nice trade in chinaware with the Latin-American countries before the war in Europe, and since that time there has been but little opportunity for the South American countries to buy from Germany, and while they have bought a goodly share from England, the trade has been hampered by lack of transportation facilities, and the result is they are looking to this country for more of their supply, which, in turn, has developed during the past year a somewhat enlarged trade.

The best part of it, however, is, indications point toward a big future business. To state it another way, we have developed a trade of nearly a quarter of a million dollars' worth in a year of chinaware proper and nearly half a million dollars of earthen and stoneware, and we have also built up during the past year a fair share in the sale of sanitary ware, including closets, bowls and lavatories.

Meantime there comes a report from Consul Thomas W. Voetter, Antofagasta, Chile, who says there is quite an urgent demand in all the South American countries for chinaware. He tells of a salesman who had been practically all over South America, in Brazil, Uruguay, Argentina and Chile, who said that everywhere he had been asked the same question by his customers: "Where can we buy chinaware in the United States, or enameled ware or nickel-plated ware?"

It seems that prior to the war most of the chinaware down in that country came from Germany, and now they are at some loss for connections. This all indicates a splendid opening for chinaware, and for the benefit of those who want to get into the game the Bureau of Foreign and Domestic Commerce has names of dealers or connections that will help out, which can be had by writing the Bureau of Foreign and Domestic Commerce at Washington and referring to file No. 81908.

The fireproof idea is an excellent one to urge, and in this connection be it remembered that brick is the best material for building purposes, fireproof and otherwise.

BUILD WITH BRICK
THE EVERLASTING MATERIAL

Under the above heading the Clay-Worker will carry from month to month, as space warrants, short articles about burnt clay products which have stood the test of time, climate, earthquakes, fire, and the elements for hundreds, even thousands of years.

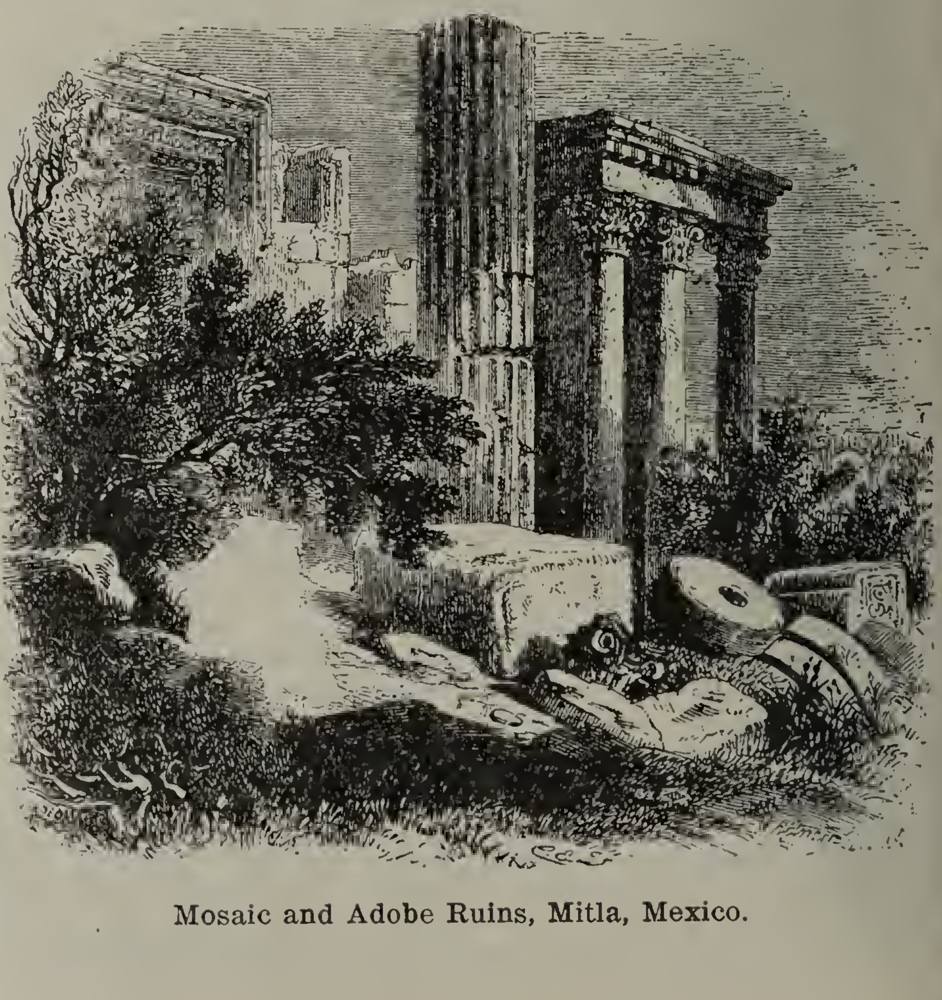
A number of these articles have been secured and cover the periods from ancient time to the present. They demonstrate that burnt clay products only are in fact the everlasting and all-resisting building material.

Each article will be illustrated with the particular subject treated.

THE FAMOUS RUINS OF MITLA, MEXICO.

MITLA, MEXICO, famed for its ancient ruins, or perhaps more properly speaking, interesting remains of Aztec architecture, lays about two hundred miles south of the City of Mexico.

The famous ruins here are in two groups, each consisting of four buildings fronting upon a central square. The illustration herewith shows the two buildings (the larger is believed to have been a temple) in the best state of preservation five years ago. Most of the buildings are wholly in ruins, and all are unroofed. Their walls are in two parts; the inner built of rough boulders plastered together with adobe, while the outer wall is formed of a sort of mosaic made by the use of oblong sunburnt adobe (clay) blocks of different colors, inserted lengthwise in spaces left for them. These ornamental parts are made of pieces of soft sandstone and adobe, seven inches long by one inch in height and two in width, accurately cut so as to fit closely together along their whole length, their heads forming a smooth surfaced front. They are laid so as to form a great variety of patterns and designs. The doors and windows of these ruins are square, with lintels of large slabe of sandstone. Beneath one of the main build-



Mosaic and Adobe Ruins, Mitla, Mexico.

ings is a subterranean chamber containing an almost perfect column of stone, called the Pillar of Death. In another chamber is a large hall containing six such pillars, which formerly supported the roof. Each is about twelve feet in height, four feet in diameter at the base, without pedestal, capital or architrave. All are of sandstone and tapateta, a natural clay, sun-baked as hard as stone by the ages.

The interior of these buildings and temple have long been stripped of their ornaments. The Indian families there have stores of idols which they claim once ornamented the walls of the ruins at Mitla. These they sell to tourists. They are made from tapateta (natural clay) and are true types of the ancient religion—awful, hideous faces, calculated to fill their worshippers with fear—the only religious feelings of which the ancient Aztecs seem to have been capable.

Written for The Clay-Worker.

NEW YORK AND VICINITY.

BRICK TENDS UPWARD steadily in the New York market, and as this is written Hudson river commons are selling at $9.75 per 1,000, and the indications are that they will advance to $10 before the week ends, and may go up to $12 or more during the month. While demand is not as active as it has been, owing to the shutting down of some building operations, it is still sufficient to absorb practically everything offered, and in some instances builders have to wait for material.

The principal difficulty in the way of production has been the lack of sufficient help. Colored laborers were hired from the South, but at the first indication of winter they went back, and thus far no one has been found to take their places. No immigration has worked seriously for brick manufacturers. Some conceived the idea of importing Mexicans, following the example of one of the large railroads, but so far as brickmaking is concerned that proposition didn't work, at least not in this vicinity. The result was that they have done nothing, and in some instances yards have been operated far below capacity because of the inability to secure the necessary help.

November was a good month. Only a few days did the temperature fall to freezing and very little rain fell. If they could have obtained labor yards could have operated through the month quite as well as they do in September. As it was, however, some of them were forced to close and none could work to capacity.

The result of this is that makers go into the winter with much less surplus than usual, probably with scarcely enough to meet requirements through the cold months. And the yards will be depleted for the opening of trade in the spring. High prices are, therefore, assured, and the opening prices next spring, when builders are anxious to get to work, will exceed those asked now.

In general the cost of production has increased proportionately with the advance in price, and profits are little, if any, larger now than when prices ruled lower and the cost of production was less. Nor has the advance in expense stopped. Everything that enters into the manufacture of brick has increased in price rapidly during the past two years and is now at a new high record. The price of brick themselves has hardly kept pace with the advance in production costs, so some are of the opinion that high prices have not brought larger profits. They hope for better times next year, when they can do business upon a different basis, perhaps.

As this is written shipments are still coming down the river by boat. No indication of closing is seen as yet. A thin skim of ice formed once or twice, but succeeding warm weather melted it all away before it had time to freeze further. November was very warm, and December opened with about the same temperature. The transportation situation has, therefore, been better than it ordinarily is at this season, and shipments by barge have continued later than is possible some years. As long as shipments come to New York by water the price stays down, but when the cost of freighting by rail is added, the price will be advanced beyond what it is now.

The building outlook for next year is promising, though thus far no very large buildings are included in the plans. A good many smaller ones are to be constructed and the total of brick used will probably be equal to the larger structures before the season ends. Investing interests are somewhat conservative because of the financial situation, preferring to hold back a little before they place important sums upon operations that may be questionable before they are finished. Business is booming at present, but readjustment is a bugbear which retards more than one enterprise, pending a more accurate determination of the trend of business following the close of the war. New York always has large operations in progress, but relatively plans are on a conservative basis for the coming year.

The tendency in general in New York now may be summed up in the fact that investors prefer to absorb old buildings and remodel them rather than to plan new ones. In doing this they manage to discount in some degree the high cost of materials. How short the supply of brick available for New York City now is can be seen from statistics for one Saturday early in the month. There were 3,600,000 common brick left over at the West Fifty-second street dock, of which 2,000,000 were under option, leaving a net of 1,600,000 for the opening of business the following Monday. On the same date 2,000,000 were on the way from Haverstraw, 800,000 from Newburgh and 2,000,000 from Rondout, of which 3,200,000 were sold before they were started for the New York market. With the 2,000,000 left over Saturday, only 3,600,000 were without option in the New York market at the beginning of that week.

One dealer only in New York is stacking any considerable quantity. It is not difficult, therefore, to imagine what will happen to the brick market if the Hudson closes suddenly, as it may at this season. The one grain of consolation is that it is possible to break the ice as far as Haverstraw if it becomes necessary. The supply is not as large as it has been usually in preceding years, but many believe it sufficient to keep building operations going all winter.

Front brick range at this writing from $19.50 to $50.00 a thousand.

BURTON.

THE EXPORT TRADE.

While the figures for the entire year are not yet available, there are enough data in evidence in the export trade in clay products for the calendar year 1916 to show that it will amount to more than $4,000,000. This will make it the biggest year on record, and the big item in the export trade is fire brick. Some idea of how the fire brick trade has developed may be had from the fact that the volume of business has more than doubled in quantity as compared to either 1914 or 1915. The total fire brick exports for 1916 run considerably above those for both 1914 and 1915 combined, and the total returns from fire brick for the year, in round numbers, amounts to $2,000,000. This makes up approximately half the total export item in clay products and shows how our fire brick friends have enjoyed an unusual demand from abroad as well as a big domestic trade.

PYROMETER TUBES MADE IN U. S. A.

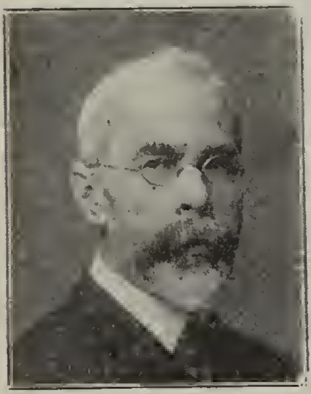
It used to be that we turned naturally to the Royal Porcelain Manufactory at Berlin for pyrometer tubes, but now, with the assistance rendered by the Bureau of Standards, they are being made at home. The Bureau of Standards designed the installation for the manufacture of Marquardt porcelain pyrometer tubes for an American concern working out the composition in the process, and the tubes of home manufacture are now in the market.

The History of the Ceramic Arts.

By Charles F. Binns.

Address Delivered on the Occasion of the Dedication of the Ceramic Building of the University of Illinois, December 7, 1916, by the Nestor of Ceramic Art in America.

THE WORD "art" is overworked in one sense and is too circumscribed in its application in another. One may grant an indulgent smile to the gentleman who poses as a tonsorial artist, and yet in the fullest sense there may be more art in a satisfactory hair-cut than in the painting on a china cup. As I understand the term, art is synonymous with directed skill. We speak of the art of the physician and the word is well chosen. Art is therefore different from science and different from handicraft. It rests upon a basis of knowledge, and upon this it builds with personal experience and power. The ceramic arts, then, do not consist entirely or even chiefly in modeling, design and drawing. They comprise the whole range of human expression in burned clay. This limitation will seem narrow to some, who would include all pyro-physical and chemical inorganic compounds under the term ceramics. It is my constant practice to do this, but as each division of the field has a history of its own and it is manifestly impossible to deal with all, I shall speak of clay products only.



Prof. C. F. Binns.

Clay has been so extensively used by man that it is not possible to confine a study of it to any one race or age. As tribes have grown into nations and nations have become empires, and empires, in turn, have blossomed into republics, so the arts of the people have been conceived and developed. The expression of the individual directed the work of the family, and the patronage and appreciation of the head of the tribe established a standard of quality. So as each nation has arisen, it has developed a production of its own. All nations have not passed, at the same time, through the stages of growth from barbarism to civilization, so that there has been primitive pottery produced at all stages of history. Primitive pottery is being made at the present time—for example, by American Indians, because these people are still living in the stone age.

In the ceramic art of the world, then, the epochs are marked, not by peoples or by geographic boundaries, but by ceramic types, and it is to these especially that our attention will be directed. It is, of course, true that the development of a type was sometimes coincident with a geographic boundary, but this was largely incidental to the rarity of travel and the difficulty of communication.

In all probability the first use to which clay was put, either dried or burned, was to make brick. Early records, if they do not establish the fact, certainly offer substantial evidence. The familiar use of clay in the building of adobe walls points to a very ancient custom, and from this to a wall of sun-dried bricks is but a step. In fact, the adobe wall, like the sod wall, is often built of clay blocks.

To what chance the discovery of the burning of clay was due cannot now be decided, whether to the hardening of clay blocks used to line a fireplace or to a household conflagration. To all intents and purposes our knowledge of pottery, other than brick, begins with the burned ware, because any ware, unless burned, must have perished long ago. Brick survived partly because of its mass and partly because the use of unburned brick was confined to a dry climate, but even the Assyrians faced their adobe walls with burned bricks, and as civilization moved northward these indestructible blocks captured and have ever since held an impregnable position. Closely allied to brick are the wall tiles which were brought to sub-perfection in Mohammedan lands. It is quite likely that the use of the rich glazed decorations, which will be discussed later, originated in these tile.

The primitive potter shaped her wares (for almost invariably the work was done by women) by hand, sometimes without the aid of any supporting form, sometimes with a wicker shape. The pieces were made with thick walls for the ease of working, and the desired lightness was produced by shaving or scraping the nearly dry clay. The burning was accomplished in an open fire. The pieces were filled with bark or chips of dry wood and placed amid the fuel upside down. Wood was then heaped upon them and the fire kept going until a mass of glowing charcoal covered the wares. The beautiful fire-flashed colors were thus the result of accident, for it can scarcely be supposed that these subtle and delicately shaded tints conveyed any pleasure to the untutored mind. In time the open fire gave place to the inclosed kiln, but the wares were still exposed to the direct flame.

The action of the fire being of fundamental importance to the production of clay wares of every description, a moment may well be devoted here to the discussion of the phenomena attending it. The thesis I would advance in this connection is that the technology of all the early forms of pottery was founded upon what chemists know as a reducing fire. There are, of course, many here who know exactly what I mean, but there are, no doubt, many present also whose line of study has fallen in other fields. I will take time, therefore, to explain the point in non-technical terms, asking the temporary indulgence of scientific men. First of all, let me explain that the term reducing has no reference to the intensity of the fire. It is not the same as "diminishing." Combustion is the union of fuel, for the present purpose being considered as carbon, with atmospheric oxygen. Carbon has a strong affinity for oxygen and will consume just a certain amount for each unit weight. If the air supply be deficient, the gases produced by the combustion are in an unsatisfied condition—that is, they are hungry for oxygen; a reducing fire is thus an unsatisfied fire. A fire in this condition, unable for whatever reason to secure enough oxygen from the air, will take it from any available source. The result of this action is noticed especially and almost exclusively in the iron oxide which the clay contains. Red clay owes its color to the pressure of an oxide of iron which is in a fully satisfied and stable condition, but if such a clay should be exposed while in an incandescent state to the action of the gases in an unsatisfied fire, the iron oxide would be robbed of a part of its oxygen and the color would be changed from red to black or gray. The constant, and one might say the typical, practice of early clayworkers was to use just such a fire. The open bonfire of the Indians, already described, was of this character. The glowing charcoal in which the pottery was imbedded was hungry for oxygen and was compelled to draw its supply from the clay, hence the Indian ware was blackened, at least in part. The early types of pottery were produced in the lands of the near East. In these lands fuel has always been scarce. Good timber does not grow there and coal was then unknown. The generally used fuel is refuse vegetable matter, stubble, brush and animal waste. This is exactly the kind of fuel to produce smoky fires, and so the practice of burning pottery in such fires grew up and prevailed. The beautiful black coloring of Greek terra cotta is the black oxide of iron, which can only be maintained by a properly applied reducing fire. The black or gray ware of the Romans was burned in a kiln into which sufficient air for oxidation could not enter. To this evidence there may be added that of Homer's hymn to Pallas Athena, the patroness of the arts:

"Pay me my price, potters, and I will sing,
Attend, O Pallas, and with lifted arm protect their ovens;
Let all the cups and sacred vessels blacken well,
And, baked with good success, yield them both fair renown and profit."

The Romans, in their victorious progress, carried the art of the potter to the lands they occupied, but as their power waned the art declined and almost vanished. The Gauls and Saxons possessed nothing better than barbaric methods in industry, and this is reflected in their clay wares. It was not until the approach of the middle ages that any advance was made, and when it came a remarkable change was evident. By some alchemy or magic the ideal became not a black, but a white ware. In Mesopotamia, Syria and Persia there arose a technique which strove more and more for a pure white pottery. The method was ingenious, but imperfect. The wares were still made of a dark-colored clay, but the white surface was obtained by a veneer of an infusible substance consisting largely of quartz flour. Upon this there was placed a transparent brilliant glaze prepared from lime, soda and quartz, this being very similar in composition to the common form of glass. It has been shown by a German investigator that this technique was rendered possible by the same smoky fire which has already been explained. The greatest enemy to the brilliance of such a glaze is sulphur, but the fuel used did not contain as much sulphur as is found in the coals of modern practice, and even the small amount which was present was rendered innocuous by the smoke.

All this does not, however, explain the reason for the change in ideals. Why was the black pottery abandoned in favor of the white? The answer to this question will be found farther afield.

In the distant Empire of China the production of clay wares had proceeded, from prehistoric times, in a manner similar to that which obtained in other lands. But the civilization of the Chinese had progressed rapidly. Its beginnings were rooted in the dim and distant past. China was locked within herself for centuries, and her records are said to date back to 2,000 years before Christ. Even if this be regarded as tradition and conjecture, the dynasty of Han, which flourished from 200 B. C. to 200 A. D., is well-established history. Even at this early date the Chinese potters were producing wares which are still the wonder of connoisseurs. As early as the date of the Norman conquest of England a ware was made by the Chinese which almost ranks as a porcelain. And in the great Ming dynasty, which began in 1368, the finest porcelain ever seen was made.

The first crusade, early in the eleventh century, began the intercourse of nations, which slowly increased until the famous traveler, Marco Polo, revealed the wonders of the far East to Europe and the near East. It thus came to pass that the potters of Mesopotamia and the surrounding districts saw for the first time the white wares of the Chinese. To men well versed in the mysteries of clay and fire, but familiar only with wares of dark color, porcelain must have seemed little short of miraculous, and it is not to be wondered at that a change came over the spirit of their dreams and the ideal of black ware was replaced by the much finer ideal of pure white.

It will not be out of place here to inquire, even if our inquiry be little more than conjecture, guided by probability, as to how the Chinese arrived at their perfection of craft and critical acumen. It has already been pointed out that they must have begun, as all peoples did, with crude wares, but their advancing civilization established standards of quality and the patronage of the Mandarin, and even of the Emperor, was eagerly sought. Finer wares were made from purer clays, and purer clays always demand more intense fires to bring out their qualities. To this condition there came the discovery of a clay of snowy white, which was found associated with a white granite rock. With the characteristic patience of the East, these materials were so blended as to produce a plastic paste. But to bring this to a sufficient density a very severe fire was found to be necessary, and at this terrific temperature, over 1,400 Centigrade, as we now know it to be, the white rock, mixed with wood ashes, could be melted to a glaze, and the same rock, mixed with white clay, was found to result in a pure translucent ware. But it still should be noted that the same reducing fire, normal to the Eastern potter, was retained. The Chinese had not then, they have not even yet, opened up their enormous stores of coal, but used wood exclusively as a fuel. The ashes of this wood were saved and mixed in the glaze, and as one ash was found to be better than others, certain kinds of wood were specified as fuel.

In the absence of a white clay, the Persian and Syrian potters were unable to duplicate the white body, so they used the white surface coating already described, and thus perfected the slip-coated ware which has ever since been characteristic of the near East. Further evidence of the Chinese inspiration may be seen in the blue decorations used, which often followed Chinese motifs. From this time on the world has adopted white wares as a standard, and has esteemed Chinese porcelain in particular as a criterion.

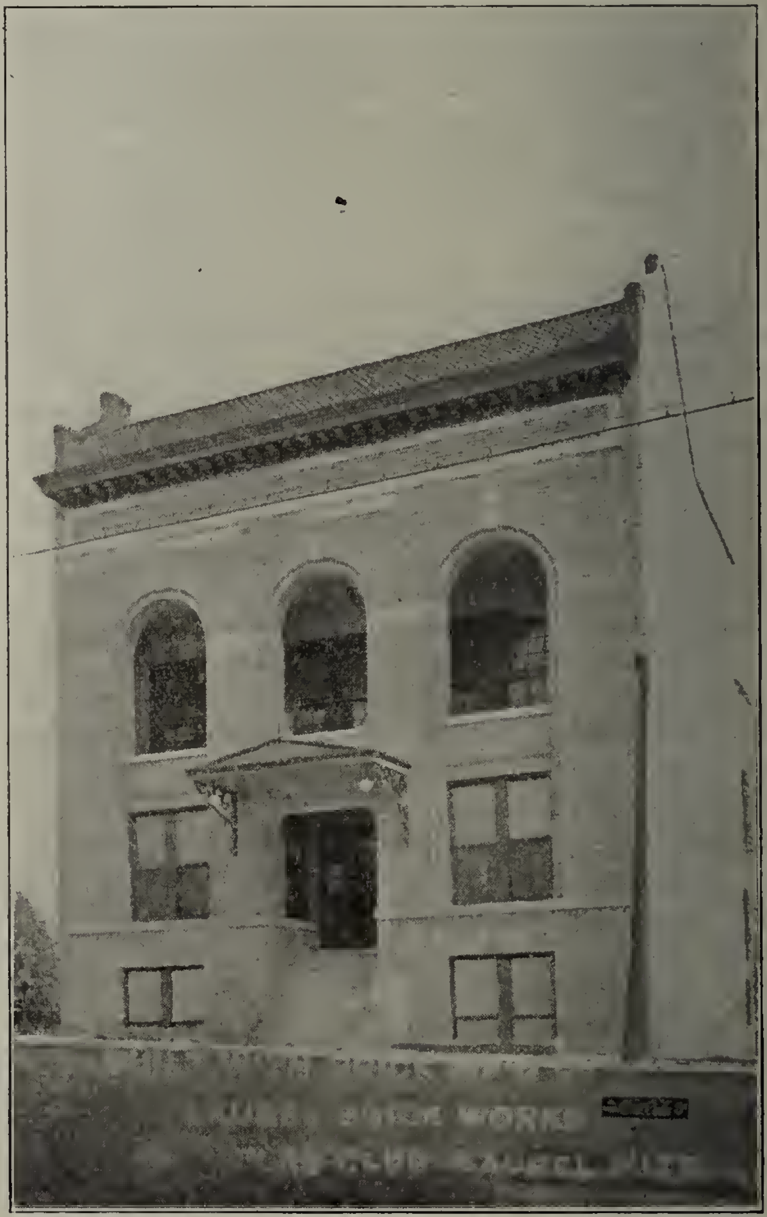
Leaving the story of porcelain for the moment, let us follow the fortunes of the Eastern veneered or slip-coated ware. The term "slip" is used technically to designate a clay or clay mixture rendered fluid by water. Where this material is used as a surface coating over a clay body the French term "engobe" is often employed, and thus the class of pottery now under consideration is often called "Oriental engobe ware." This pottery is in a class by itself. It is of very beautiful appearance and possesses characteristics which are unique and which have been evolved from the processes of production. The ground is usually a pearly white or light gray, though occasionally a piece is found which is of a delicate pink color. The decoration is outlined in black and the typical colors are the deep blue of cobalt, the turquoise of copper and the purple of manganese. There is occasionally found also a rich iron red. The especial point of interest is that these colors depend for their peculiar quality upon the nature of the glaze which covers them. This consists essentially of a silicate of lime and soda and is radically different from the glazes of the present day.

The manufacture of this beautiful ware was carried on in the lands under Mohammedan rule, and thus may be classed with Damascened steel and embossed leather. Beginning in Mesopotamia, or in the general region of which the city of Bagdad may be considered the center, the knowledge of the art spread throughout Persia and Syria. Thence it passed along the northern coast of Africa to Morocco. Spain was repeatedly invaded by the Moors, and by the beginning of the thirteenth century Moorish influence was established there. One result of this was the development of the style of decorative art known as Hispano Moresque, of which the palace of the Alhambra at Granada is one of the best known examples. The Moors brought with them their knowledge of pottery making, but before long a new idea was born and a different fabrique established. From some unknown source the knowledge arose that a glassy glaze could be made opaque by the admixture of oxide of tin, and at the same time it became known that oxide of lead would make a more brilliant glaze than had hitherto been made with soda. From these facts there was developed a brilliant, fusible, opaque glaze, which enabled the potters to manufacture a white surfaced ware without resorting to the under coat of slip, which up to this time had been indispensable. That is to say, they could cover their dark clay with a substance which gave them white color and brilliant surface in one and the same operation, thus dispensing with the slip veneer. Besides this, they found that the glaze made from lead was much more easily fused in their kilns than the former glaze had been.

Thus there arose the tin-enameled or stanniferous wares of Spain, upon which the well-known golden and lustrous decorations were perfected. Traffic existed, no doubt, along the northern shore of the Mediterranean Sea, and the cargoes contained numerous specimens of this ware. Perhaps because the island of Majorca lay in the line of traffic, or because some of the ware was made there, the pottery was known as the ware of Majorca, and this became, in Italian, Majolica. Italy at that time was beginning to feel the thrill of the Artistic Renaissance, and the artists and critics were quick to seize upon this new means of expression. Luca della Robbia, an architect and sculptor, began to cover his clay figures with white enamel. Giorgio Andreili of Gubbio produced a magnificent red luster. The cities of Urbino, Siena, Castel Durante, Faenza and many others contributed their quota each with some especial modification of style. The great volume of the product may be inferred from the numerous examples, some fine, some inferior, which are found in all modern museums. The methods of the Italian potters are well known, for the history of the art was written in the year 1548 by one Piccolpasso. In this work the author describes in detail the preparation of the clay, the shaping of the pieces, and the many processes by which the enamels and the lusters were produced.

Kiln Sheds of the Laurel Brick Company.

In the progress of this manufacture from the last quarter of the fifteenth century to the end of the sixteenth a gradual change in technique took place. The Italian workers succumbed to a temptation to which many modern potters have also fallen victims. This was the ease in working which results from the use of oxide of lead in excess. It would not be difficult here to moralize upon the danger of "flowery beds of ease," but we are dealing with facts. The facility with which lead compounds can be fused has already been mentioned. It was found that by increasing the proportion of lead in the enamel it was possible to use a less severe temperature in the kilns and yet to secure a brilliant surface. This was the temptation. Little by little the lead was added, with the result that the fusible glaze so obtained dissolved the best of the colors. The palette was denuded of one tint after another until, finally, the remaining colors were blue and yellow. These were able to withstand the solvent action of the lead, and consequently they held their position. This was the condition of the Italian product when the knowledge of the art spread northward to Holland and the Netherlands. At this point a new Chinese influence made its appearance. The Dutch were the most enterprising of merchants, and they brought to Europe new supplies of Chinese porcelain. This was decorated for the most part with cobalt blue, which is capable of withstanding the intense porcelain fire. The potters of the town of Delft combined this fact with the knowledge of enameled ware which came from Italy, and so was produced the well-known blue pottery for which Delft became famous. So completely did this ware take possession of the market that blue pottery has been called Delft ware to the present time. The Delft potters were the first to form a trade guild. Inspired perhaps by the Hanseatic League, they formed the Guild of St. Luke, to which entrance was permitted only to those workers who could demonstrate their skill to a committee of experts. This guild controlled the production of pottery in Delft and the neighboring towns, and no doubt contributed to the quality of the wares.



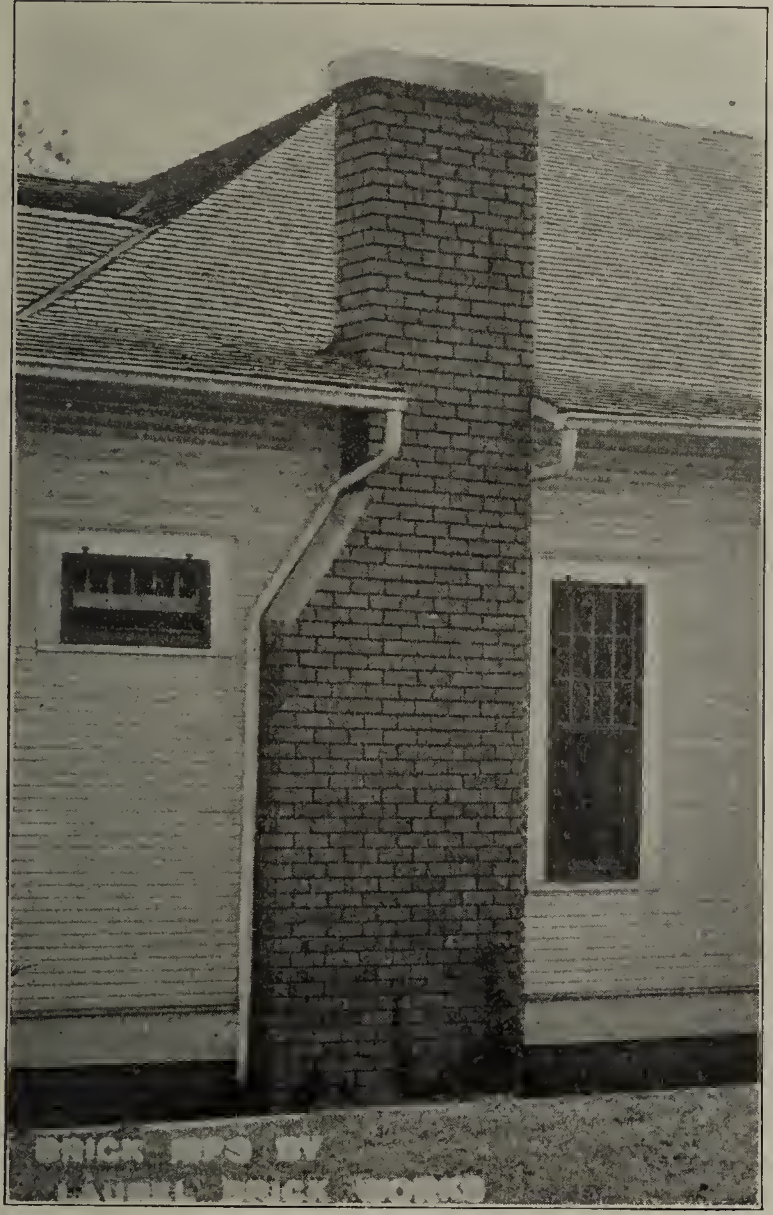
Elks' Club, Laurel, Miss.

It will be necessary now to leave the field of enameled pottery for a moment to discuss a class of wares which formed a large part of the production of the German states. Some time in the fifteenth century it was discovered, exactly when and where is not known, that pottery made from a certain type of clay could be glazed with the vapor of common salt. The clay used was generally refractory in nature—that is, it would withstand the action of a high temperature. In modern times it would be known as a second-grade fire clay. The pottery was made in three colors, brown, gray and a pearly white, and these colors were due to variations in the clay itself. The forms were shaped on the wheel, decorated with modeling and applied embossment, and set in the kiln in such a way that each piece was exposed to the gases of the fire without protection. As soon as the kiln with the contained pieces had reached a certain temperature salt was thrown upon the fire. The heat vaporized the salt and the vapor passed in among and circulated around the pottery. Salt consists of sodium and chlorine. The chlorine passes away with the smoke, but the sodium condenses upon the glowing clay in the form of minute drops, and produces the interesting orange-skin texture which is the distinguishing feature of salt-glazed pottery.

(To be continued.)

MAKING BRICK IN THE SUNNY SOUTH.

A CLAY BANK that will furnish raw material for a prosperous brick plant for nearly one hundred years to come is one of the chief assets of the Laurel Brick Works, at Laurel, Miss., one of the attractive towns of southern Mississippi The clay, which averages 12 feet in depth, is taken from the bank to the plant in cars, where it passes through a disintegrator and a pug mill before it goes to a soft mud machine.


A Laurel Brick Chimney, the Best Part of a Frame House.

From the machine the brick go by cable system to a pipe rack dryer, where they stay ten hours; then to the kilns, of which there are three, with a capacity of one-half million each. They are burned with wood, and this part of the operation takes seven days, three days for watersmoking and four days to finish. When burned, the brick are a trifle smaller than the N. B. M. A. standard size, being 2½x3⅞x2¼.

Nothing but common building brick are made at this plant, but they are of such an excellent quality that they are used for fronts in all of the larger buildings of Laurel, which is one of the thriving smaller towns of the South.

Mr. S. S. Schneider, the owner of the Laurel Brick Works, has sent us a number of illustrations of these buildings, some of which are reproduced herewith, which he says gives only a slight idea of the real beauty of the Laurel brick. The town is growing and Mr. Schneider found it necessary last spring to double the capacity of his plant in order to meet the increasing demand for his product. In 1915 he made and sold 9,000,000 brick at an average price of $6.00 per thousand, and his 1916 output will almost double that. Mr. Schneider is to be congratulated on his part in the "Build with Brick" campaign in Laurel, where business buildings, churches, school and residences are built of Laurel brick.

THE CLAYS OF ARKANSAS.

Deposits of clay are so common that the clay resources of a state seldom attract much attention, yet clay may be put to an infinite variety of valuable uses, and its annual output in the United States is worth more than $150,000,000. The state of Arkansas produces clay of several kinds, which are described in Bulletin 351 of the United States Geological Survey, Department of the Interior. This bulletin not only states the locations of the clay deposits of the state, but describes their composition, character, origin, occurrence and uses. The clays are classified as residual clays, clays of mechanical origin, clays and kaolins of chemical origin, and bauxite. The production in each county is considered separately, and the uses to which the clay is put are given. An interesting use has been made locally of some of the potter's clay found in Dallas county. It has been dissolved in buttermilk and boiled and used as a whitewash. When so used it gives a smooth coat of slightly bluish tint, which is said to be about as durable as a coating made with lime.

Methodist Church, Laurel, Miss., Built of Laurel Brick.

A copy of Bulletin 351 will be sent free on application to the Director, U. S. Geological Survey, Washington, D. C.

PURINGTON PAVING BRICK COMPANY JOINS DUNN FORCES.

The Purington Paving Brick Company, of Galesburg, Ill., has become a licensee of the Dunn Wire-Cut-Lug Brick Company, of Conneaut, O., and will engage extensively in the manufacture of wire-cut lug brick. The Purington company is one of the biggest paving brick concerns in the United States, with a daily output capacity of about 350,000 brick. The Purington organization consists of F. G. Matteson, president and treasurer; George C. Prussing, vice president; W. H. Terwilliger, secretary; W. G. D. Orr, general manager.

Thorough good drying and burning is the best, quickest and cheapest way to improve the common brick product so that it may hold its own against competition in wall building. Reduce the percentage of underburned brick and you will improve the market for the product.

A. E. Huckins.

WHO CUT THE PRICE?

A Play With a Moral.

CHARACTERS.

E. Z. Bye	A Brick Manufacturer
John Dough	A Brick Manufacturer
Art Work	An Architect
Mr. Contractor	A Contractor
Helen Hunt Holme	A Prospective Builder

This play was written and presented by A. E. Huckins, *Secretary of the Illinois Clay Manufacturers' Association, at the last Illinois convention. The purpose of same was to show the real cause of ruinous cut-price methods.*

Setting: Office of E. Z. Bye, brick manufacturer, including desk, letter files, two or three kinds of brick, telephone and calendar. Enter E. Z. Bye and John Dough.

E. Z. Bye: "Sit down, John, while I run over this mail. This brick game is getting rather strenuous, particularly when you have seven face brick men and as many common brick and tile men on a job."

John Dough: "Which would not take to exceed 50,000 brick, face and common included."

E. Z. Bye: "Figure it up, John, and see just what the selling expense was on this job. Here I was specified, by both the architect and owner, particular friends of mine, and those pirates over at Griggsville come in with a price of $12.00 f. o. b. cars."

John Dough: "Why no. They had no such a price as that. Their price was $16.00 f. o. b. cars."

E. Z. Bye: "No, Mr. Contractor is a good friend of ours and buys practically all of his material through us, that is, price being equal, and he advised me that they sold these brick for $12.00. You wait. The next opportunity I have, I will burn those fellows up. What do you get for that selling cost?"

John Dough: "Well, let me see. There were seven face brick and five common brick and tile fellows, and each trip could not cost less than $10.00."

E. Z. Bye: "That is $120.00 per trip."

John Dough: "Each man, no doubt, made one preliminary trip, one to the letting, which was deferred, and then you will recall they selected any one of three brick and these three men were required to go back again."

E. Z. Bye: "As you will remember, the contractor did not buy his brick for thirty days and Jones told me he made a second trip back to see the contractor—even when he had lost the order before he made the first one."

John Dough: "The contractor evidently did not like to tell him that he had placed the order. This cost the face brick fellows, alone, $300.00 on a $240.00 job."

E. Z. Bye: "Well, Jones ought to lose this job. What does he mean by having two men on a letting?"

John Dough: "Well, goodbye, E. Z. See you at lunch." (Exit.)

(Enter Art Work and Helen Hunt Holme. Art Work with roll of blue prints. Helen Hunt Holme with catalogs and pictures.)

Art Work: "Good morning, Mr. E. Z. Bye. I would like to have you meet Mrs. Holme. (Greeting.) She is going to build a new residence and she likes these plans in a general way, which I have here, but we were talking material and came over here to get brick ideas."

E. Z. Bye (looking at plans): "What is your idea, Mr. Art Work, of brick for this building?"

Art Work: "I rather favored your rough brick. I believe this will fit in well with this type of architecture." (Expounds on art.)

E. Z. Bye: "Yes, that is very pretty." (Placing brick on desk. All stand back and look at brick while brick man explains art of his product, in comparison with the other more extreme variations, etc., affecting the mass of the brick work in this residence.) "What do you think, Mrs. Holme?"

Helen Hunt Holme: "I do not believe I should like that brick. As I have told you (addressing architect), I have never forgotten Cousin John Franklin's home immediately after he completed it. Everything was so clean and white and nice. I have not seen their home from that day to this. How pretty it must be by now, with vines running up over those white walls."

E. Z. Bye: "What kind of brick was Mr. Franklin's house?"

Helen Hunt Holme: "Oh, it was not brick. It was clap board siding, and up above, the cement stuff in panels."

E. Z. Bye: "Is it the John Franklin who lives on Highland avenue?"

Helen Hunt Holme: "Yes."

E. Z. Bye: "I would like very much to show you some of our material in completed homes, so that you may get an idea of what our product looks like in the wall, showing different textures, mortar colors, etc."

Art Work: "You know that makes a wonderful difference in the appearance of any brick."

E. Z. Bye: "I would like very much to have you come with me in my machine and we can also run by Mr. Franklin's home. If you, also, can spare the time, Mr. Art Work, I would like to have you go along, as I have a new texture which we have not yet named and which I would like very much to have you see. We are putting this in Mr. Carter's new home. (All agree and exit.)

Time—One month.

E. Z. Bye (who immediately uses phone): "Give me the brick plant. Hello, Miss Millen. Is Harley there?—You say he wants to know where to pile that new texture brick?—Well, you tell him I just sold an order for the best house in Peoria. It will take about 100,000, fence and all, and you better accumulate that many quick, as this job will go fast.—Yes, medium shade.—You know we will not get any too many of these. Do not let these get away from you under any circumstances. This is absolutely sold, signed, sealed and delivered. Tell Spencer he better promote the dark shade on his job. Goodbye."

John Dough: "Ready for lunch, E. Z.?"

E. Z. Bye: "Yes. Say, I had a fine experience this morning."

John Dough: "I hope it cheered you up after yesterday's grouch.".

E. Z. Bye: "Yes, I sold 100,000 of our new texture medium shade, after they looked at all the brick in town and incidentally where the stucco had been on Cousin Franklin's home, and consulted Cousin Franklin on the cost of painting and the number of times he had replaced the stucco, already. This time, I am absolutely specified and authorized by the owner to accumulate the brick." (Takes hat.)

John Dough: "Have you sold this job?"

E. Z. Bye: "Yes, $20.00, too." (Exit both.)

Time—One month.

Enter E. Z. Bye: "Well, I feel pretty good about Mrs. Holme's new residence. That went to Mr. Contractor and he is a friend of ours."

Enter Mr. Contractor: "Morning, E. Z."

E. Z. Bye: "Morning, Mr. Contractor. Well, I see you closed up on Mrs. Holme's new residence."

Mr. Contractor: "Yes, how about the brick?"

E. Z. Bye: "$20.00 per thousand, as stated in the specifications. That is some specification; names your price, shade, color and number. You cannot get away from that very easily. I guess that will make Griggsville pick up their ears after that $12.00 price."

Mr. Contractor: "Mrs. Holme advised me that either yours or John's brick would do. His shade is No. 4760 and he prices these to me for $15.00."

E. Z. Bye: "Why, are you sure, Mr. Contractor? Mr. Holme told me absolutely that I had this order and to accumulate the brick, which we have done, and which we are holding for *this* job."

Mr. Contractor: "Well, $15.00 is all I can pay."

E. Z. Bye: "It is absolutely ridiculous for us to think of selling this brick for any less than $20.00, as we are obtaining this at other points, and have turned down orders on this shade in order to stock this quantity, endeavoring to promote other shades on these other orders."

Mr. Contractor: "Well, of course, I am very sorry, but under the circumstances, I most certainly cannot afford to pay you $5.00 per thousand more than I do John for a brick which is equally satisfactory to Mrs. Holme."

E. Z. Bye: "But you know, Mr. Contractor, that John's brick are not absolutely standard size, and the difference in laying our brick is considerable. You have already conceded this."

Mr. Contractor: "Oh, yes, E. Z. Bye, but a brick's a brick and if this brick satisfies Mrs. Holme, it most certainly satisfies me, and you are now talking small items on this little order. I am busy this morning and I want to get this brick business wound up and off my hands. If you cannot do any better, I will have to give John this order."

E. Z. Bye: "All right, Mr. Contractor. We will ship you the medium shade new texture at $15.00." (Contractor exits, while brick man turns his back on the door. Contractor mutters to himself that he put one over that time. Enter Mr. Art Work and Mrs. Holme. (After greeting.)

Art Work (greetings): "Well, Mr. E. Z. Bye, Mrs. Holme and I were talking over some of the details which she would like to change slightly. On our way down, we passed by Mr. Cathcart's home, which is out of your dark shade new texture brick."

(Continued on page 568.)

WARNING AGAINST CHRISTMAS FIRES—SOME RULES FOR PREVENTION.

The National Fire Protection Association is issuing a circular to business establishments and to home owners warning them against the danger of fire during the holiday season.

To Business Establishments.

The warning to business establishments contains the following suggestions:

"Light, inflammable decorations make fires easy to start and easy to spread. A match, a gas flame or an electrical defect may do it.

"Watch gas jets! Decorations may be carried against them by air currents.

"Watch smokers! Do not permit them to light cigars inside your buildings.

"Do not make the slightest change in electric wiring without consulting electrical inspector.

"Read your insurance policies! Before attempting any hasty or ill-advised decoration which may cause fire, examine your insurance contract and see if the policies contain anything like this: 'This entire policy, unless otherwise provided by agreement indorsed hereon or added hereto, shall be void,' etc., etc., 'If the hazard be increased by any means within the control or knowledge of the insured.' If you burn, you want your indemnity; do nothing, therefore to impair your contract.

To Householders.

"Every year in America many children are burned to death by fire from Christmas candles.

"Do not decorate your Christmas tree with paper, cotton or any other inflammable material. Use metallic tinsel and other non-inflammable decorations only, and set the tree securely so that the children, in reaching for things, cannot tip it over.

"Do not use cotton to represent snow. If you must have snow, use powdered mica or asbestos fiber.

"Do not permit children to light or relight the candles while parents are not present. They frequently set fire to their clothing instead. Electrical illumination is safer.

"Do not leave matches within reach of children at holiday time. Candles are meant to be lighted, and if the children can get matches they will experiment with them. They imitate their elders.

"Do not allow trees to remain inside buildings after the holidays. The tree itself ignites readily when needles have become dry. A large number of fires usually occur in January from this cause.

"A House of Merriment is better than a House of Mourning."

A BUSY CORNER.

More than 25,000 Vehicles a Day Pass Forty-Second Street and Fifth Avenue.

More than 17,150 vehicles pass Fifth avenue and Forty-second street, New York City, going north and south, daily. If the east and west traffic be added, the total of vehicles passing the intersection of these two thoroughfares exceeds 25,000, which is an increase of more than 1,000 a day as compared with last year. During the rush hour, which is between 3 and 4 o'clock, when the shoppers begin to return home, more than 2,500 vehicles an hour pass in Fifth avenue.

Joyous Tidings.

"Charley, dear," said young Mrs. Torkins, "I have good news."

"What is it?"

"The bank sent me word that my account is overdrawn. I looked in the synonym book and found that 'overdrawn' is the same as 'exaggerated.' "—Washington Star.

Annual Meeting of the American Face Brick Association.

A Convention Without a Program, Without Entertainment Features, But Just "Shop-Talk" Which Participants Pronounced the Best Ever.

ONE KNEW THERE was something unusual doing at the home of Prince Pluto immediately upon leaving the train at French Lick, for the trees along the splendid walkway leading to the Taggart Tavern were decorated with blue-letter signs which read, "ONE MORE." On entering the hotel lobby, other signs, red-lettered, caught the eye, which excited the curiosity of the uninitiated, and on making inquiry of the obsequious clerk back of the desk, attention was directed to another sign reading, "What does one more mean? Well, friend, it depends a heap upon where you start and where you are at." Another placard bearing one of the famous Abe Martin sketches stated that "ONE MORE" means "Big cigars and limousines." This, perhaps, is true when applied to the brick business, if "ONE MORE" means a dollar more per thousand. The general impression prevailed, however, that at French Lick it meant one more glass of Pluto.

Paul B. Belden, Canton, Ohio.

The convention was the best attended meeting that the American Face Brick Association has held. The delegates came from far and near. There were two hundred or more of them, including many of the best known and most successful men engaged in the business. And there came also many of the leading face brick dealers from all sections, all seemingly bent on a real get-together-for-big-business occasion. The various sessions and conferences were well attended and a spirit of harmony and earnest effort was in evidence on all sides and at all times. A pleasing bit of levity was injected by the Cincinnati Brick Club, which, soon after arrival, proceeded to initiate each batch of newcomers into the Ancient Order of Yellow Dogs.

Secretary Hollowell had mapped out a program for the American Face Brick Association, providing for one regular session a day for members only, and a series of conferences or round table talks for the different sections or groups of delegates between times. The first open session of the convention was held Wednesday afternoon, with President T. B. Belden in the chair. He made a record-breaking address—that is, it broke the record for brevity and forcefulness. He congratulated the members on the large attendance and expressed the hope that the meeting would prove of material benefit to each and every member. The secretary's report followed and was full of cheer and refreshing facts. Among other things, it stated that the membership had increased 70 per cent. during the past year, and he hoped to show like progress the coming year. The report concluded with the financial statement, which showed a substantial balance on the right side of the ledger.

Following the secretary's report, a resolution was offered by J. Parker B. Fiske, and adopted, to the effect that manufacturers should strive for uniform terms of sale, discount and interest, making bills payable the 15th of the month following sales, with uniform interest on deferred payments.

Mr. J. M. Adams, chairman of the cost committee, made a verbal report on the work of the committee the past year, during which time the assistance of expert accountants had been secured, and expressed the hope that their recommendations would be accepted and a uniform system of cost accounting become the rule and not the exception. Mr. Adams asked the privilege of introducing Mr. W. J. Snyder, Brazil, Ind., who, when the applause subsided, stated that cost accounting had long been one of his hobbies and that he knew from experience that it was an important element in the conduct of any successful plant. He read from a speech of Edward N. Hurley, of the Federal Trade Commission, delivered before the Coal Dealers' Association, urging concerted action in such matters for the betterment of industrial interests.

There was a similar session Thursday and the convention finished its labors Friday noon with the election of officers, as follows:

Officers.

President—George A. Bass, St. Louis, Mo.
First Vice President—S. C. Martin, Pittsburg, Pa.
Second Vice President—J. M. Adams, Columbus, O.
Secretary-Treasurer—R. D. T. Hollowell, Pittsburg, Pa.

THE FACE BRICK DEALERS' MEETING.

While the Face Brick Dealers were not headliners at the French Lick show, they were there with the goods, and had several sessions devoted to their own particular interests. There were nearly one hundred of them present and they made their presence felt. The interest manifested in their proceedings demonstrated quite thoroughly that the Face Brick Dealers have come to a full realization of the fact that for the best measure of success they must co-operate one with another, and that, too, they must act in concert with the manufacturers if the business is to prosper as it really should.

Their sessions were well attended and enthusiastic. There was an interchange of views and experiences in the various details of the business which was both interesting and instructive. The meetings were presided over by Mr. A. S. Reid, of Newark, N. J., who proved the right man in the right place. Local organization and co-operation was recognized as the keynote for future work. The elimination of unfair competition and more cordial business relations were declared to be essential for the largest measure of success.

An incident of the final session was the reading of a telegram from Capt. Robt. L. Queisser, who, with his two sons, is doing guard duty on the Mexican border with the Fifth Ohio

Regiment. The reading of this telegram was received with a round of applause. A motion was made and promptly carried that the best wishes of the association be immediately communicated to Captain Queisser. The Face Brick Dealers' Association of America elected officers for the ensuing year, as follows:

Officers.

President—A. S. Reed, Newark, N. J.

Secretary-Treasurer—Harold W. Holmes, Detroit.

Executive Committee—W. G. Thomas, Detroit; F. Lawson Moores, Cincinnati; H. L. Matz, Chicago.

State Vice Presidents—J. A. Dobbin, Boston, Mass.; F. B. Freeman, Pittsburg; B. Mifflin Hood, Atlanta, Ga.; A. D. Klein, Omaha, Neb.; C. E. McCammon, Cincinnati; E. F. Dartnell, Montreal, Canada; Chas. Bonner, Chicago; A. E. Bradshaw, Indianapolis; Samuel E. Matter, Duluth, Minn.; S. A. Morman, Grand Rapids, Mich.; Geo. E. Schwartz, Milwaukee; Thos. H. Simms, Birmingham; Alfred Tyler, Baltimore; F. C. Manson, New York; Isaac H. Tyler, Louisville; J. G. Grinnan, Norfolk, Va.; Fritz Jahncke, New Orleans, La.

BUTTONHOLE TALKS WITH THE DELEGATES TO THE A. F. A. CONVENTION.

G. B. Lucket, of the Crawfordsville (Ind.) Shale Brick Co., reports that they have had a good year and it looks like a good business ahead for the next year. He expects to be on hand at the McAlpin, N. B. M. A. week.

A. S. Reid, president of the Face Brick Dealers' Association of America, is head of the well-known firm of A. S. Reid & Co., Firemen's Insurance Building, Newark, N. J., and they have had their share of business during the year in face brick, hollow tile, fire proofing, etc.

W. E. Dunwody, president of the Standard Brick Co., Macon, Ga., is one of the greatest brick boosters that the South country furnishes, and is not only a believer in organization, but is also a worker in the cause. Incidentally he is an enthusiastic booster for his home town, too.

P. R. Ketcham, manager of O. W. Ketcham, burnt clay products, reports business very good with them. Their home office is Master Builders' Exchange; Philadelphia, with branch offices at Baltimore in the Baltimore-American Building, and in New York in the Johnson Building, 1170 Broadway.

E. C. Clark, of the Kittanning Brick and Fire Proofing Co., says it has been a good year in Pittsburg. The brick business has not been as active as the steel business, but prosperity in that industry has naturally reflected itself some in building operations and made the past year a fairly good one in the trade.

Charles Bonner, president of Bonner & Marshall Brick Co., Chicago, says they have had a very busy season of it in Chicago. Also, he is very much pleased with the fact that they have a good brick club in Chicago, which is developing a spirit of co-operation that makes for better business and better profits all around.

J. Parker Fisks says that in New York the war order business has the right-of-way over everything else, so the brick business in the big city has been a bit slow as compared to war order industries, but at other eastern points served by them they have done fairly well, and consequently they are not disposed to complain of the year's business as a whole.

Daniel Reagan, of the Hocking Valley Clay Products Co., Columbus, came down early Thursday morning with his golf clubs, but found the rain interfering with the game. He managed to play a round later in the day, however, and would have had another round next morning if he could have found anybody with courage enough to defy the weather. It takes more than "wet grounds" to make "Dan" lay off, even for an afternoon. He is as full of energy as any egg is of meat, at 50 cents a dozen.

The Standard Brick Manufacturing Co., of Evansville, Ind., was on the job early in the person of John Andres, secretary-treasurer. H. C. Kleymeyer expected to come, but was detained at home looking after the loading of a barge for river shipment. They have had a fairly good year, starting out with quite a stock on hand from last year, which they have cleaned down considerably, while at the same time keeping their plants at work and disposing of the year's output.

Elisha K. Kane, of the Kushequa (Pa.) Brick Co., is also interested in a short line railroad known as the Kushequa route, and he is lessee of the Kushequa Ceramic Co. plant. In this latter plant he has the Heinz's fifty-seven varieties skinned a mile, for he lists 121 different shapes of tile products which he is actively producing and selling in addition to brick. The two plants are so located that he can make mixed car shipments, including with the brick either floor tile or roofing tile. Trade with them has been very good and their main trouble lately has been a shortage of coal, which has caused some shutdowns. Also, it looks like the price of coal is going to add materially to the price of brick. Mr. Kane figures that a dollar a ton increase on coal means approximately a dollar a thousand increase in the cost of making brick.

A. S. Reid, Newark, N. J.

Clarence S. Nixon, secretary of the Paine & Nixon Company, Duluth, Minn., says they have one of the best and most complete displays of face brick in the Northwest, and they not only have the lines to represent, but they are in a position to give excellent service, consequently they have been getting their share of the business right along. Moreover, they have been in the game for sixteen years now and feel like they are qualified in all the essentials of the brick dealers' game.

Dayton, Ohio, has been one of the busy spots in the country during the year vying with Akron and Detroit. As is naturally expected under these conditions, R. C. Harbison, of the Gaddis-Harbison Brick Co., reports that they had a very busy year.

B. J. Cummins, of the Cummins Brick and Tile Co., Syracuse, N. Y., reports a very good year and is looking forward cheerfully to the future.

F. N. Blanchard, of the Nebraska Material Co., Lincoln, Neb., says they had a good year and they have fine prospects ahead for the next year.

Edmund J. Burke, of the American Clay and Cement Corporation, Rochester, N. Y., reports a good year's business, with a cheerful outlook ahead for the next year.

One of the southern delegates who enjoyed very much the attendance at French Lick was J. B. Morrison, manager of the Alto Brick Co., of Rome, Ga.

H. B. Schaal, vice president of the Hocking Valley Fire Clay Co., says they have had a fairly good year's business. This concern manufacturers salt glazed brick and encaustic paving tile at Nelsonville, Ohio.

Donald H. Cameron, of the United Fuel & Supply Co., Free Press Building, Detroit, says they have had a hustling year in Detroit and their main trouble has been to get the material with which to supply the demand.

Chas. F. Hermann, of the U. S. Brick Co., Tell City, Ind., says they have had a very good year all around and he has no cause for complaint. He is not only boosting fire brick, but is also active in the exploitation of drain tile.

Lawson Moores, of the Moores-Coney Co., Cincinnati, Ohio, is a very earnest association worker who understands the game in the broader aspects and he has been a factor in bettering the conditions among face brick dealers.

W. R. McKown, secretary of the Brooklyn Brick Co., Indianapolis, Ind., says they sold 13,000,000 brick this past year and could have disposed of 2,000,000 more if the shortage of cars during the winter had not hampered their work some.

Harold W. Holmes, who is secretary of the Face Brick Dealers' Association of America, is not an outside man but is a brick-man, being president of the Colonial Brick Co., Penobscot Building, Detroit, which handles face brick and building specialties of all kinds.

J. J. Neer, manager of the B. Mifflin Hood Brick Co., Atlanta, Ga., says that the brick business has been rather slow in the South the past year. They have had a very good trade in the territory East, however, and are looking forward to better business in Atlanta next year.

Carl C. Walters, general manager of the Fultonham-Texture Brick Co., East Fultonham, Ohio, says business has been very fine with them this year and they have not even been troubled with coal shortage during the winter because they get their coal by wagon from nearby.

James A. Hogan, secretary-treasurer of S. S. Kimbell Brick Co., Chicago, is an enthusiastic member of the Chicago Brick Club and is well pleased with the fact that this club has done much to bring about uniform terms of sale and service and to beget co-operation generally among brick men of Chicago.

H. H. Frazer, of the R. B. Tyler Co., Louisville, Ky., was one of the younger delegates attending his first convention of the brick folks and he enjoyed very much the meeting with other dealers and manufacturers. He says they have had a very good year's business and are looking forward to another busy year.

George W. Nueschue, of the Manufacturers Equipment Co., Dayton, Ohio, who was busily mingling with the brickmakers at the French Lick convention, claims to be the oldest clay machinery salesman in service on the road. It follows, of course, that he has a great host of friends and acquaintances among the brick folks.

S. A. Morman, head of S. A. Morman & Co., dealers in fuel and builders' supplies, Grand Rapids, Mich., reports a fairly good year in the brick business. Also, Mr. Morman is interested in a line of machine tool manufacture and this business has been doing well, too, because there has been an unusually good demand for machine tools.

G. J. Supple, of the Western Brick Co., Danville, Ill., says it has been a big year with them all the way through, and they could have made it a little bigger but for the car shortage this winter, which has hurt them some by hampering shipments. It has not interfered with their coal supply, however, because they mine their own coal.

L. L. Stephenson, Birmingham, Ala., manufacturer of shale building brick at Lovick, Ala., says that while there has been considerable activity in the metal working industries of Birmingham, the brick business during the year has not been as active comparatively as the general prosperity of the country down there would indicate. They have done very well and they expect better times in the future.

D. H. Downey, sales manager of the Martinsville (Ind.) Brick Co., says they didn't quite make it three in one this year, but they came very near it and did about two years' business in one and hoped to do at least three years' business in two. Mr. Downey carries a pet finger, but he didn't get this either in a badger fight or the yellow dog kennel, but brought it to the convention with him.

T. L. Herbert, Jr., of W. G. Bush & Co., manufacturers of hydraulic press brick at Nashville, Tenn., says they have had a fairly good year, but the prosperity down in their country came rather late in the season, consequently the year as a whole was not as big in a business way as in some other parts of the country or as it would have been had the early months shown the same activity that has prevailed since last fall.

Homer Wiseman, sales manager of the West Virginia Clay Products Co., Charleston, W. Va., made the return trip via Louisville, going down with the Louisville delegation. His concern is one that has not been troubled by the coal shortage, and the reason is that they burn gas. They make a dry pressed brick from shale and their leader is an iron spot face for which they have had a very good demand during the year.

G. G. Landgrebe, secretary of the Huntingburg (Ind.) Pressed Brick Co., says they have had a good trade. In fact, it has been a very busy year. About the only thing hampering work being a shortage of coal, which caused them to shut down for a time and resulted in their selling out practically all of the accumulated stock on hand. They manufacture stiff mud face brick in red, buff, grey glazed, rough and also dry pressed fire brick.

Tyler seems to be a favorite name among the brick dealers, as there are three Tylers on the roster, two of whom were made vice presidents, Alfred Tyler, of Baltimore, and Isaac Tyler, of Louisville. The Louisville representation sounded like a Tyler organization, since it consisted of the Tyler Building Supply Co. and the R. B. Tyler Co. The Tyler Building Supply Co. was represented by Isaac Tyler and Leo Parsons, while the R. B. Tyler Co. was represented by H. H. Frazer.

G. M. Mossman, general manager of the Mossman Bros. Co., dealers in brick and other building material, Huntington, W. Va., is proud of the showing that Huntington has made in the brick boosting line. He says that one of the distinctive features of their town is the great percentage of brick buildings, not only home buildings, but real estate men building homes for sale have come to appreciate the value of brick, and as a result there are very few worth while homes being built in Huntington except that they are built with brick and include good face brick. The favorite form of construction there, he says, is face brick and hollow tile.

J. W. Bostick, president of the West Salem (Ill.) Hollow Brick & Tile Co., is a new man in the brick business and was attending his first convention. He had his early training in the banking business, in which he still has connections, and took on the management of the brick business at West Salem last April. Since that time they have turned out about 2,500,000 brick and have done a fairly good year's business considering the size of their plant and the fact that he only started into it last spring.

And they had a badger fight. A badger fight is a thing of frequent occurrence around the home of Pluto and they have a husky and well-trained English bull dog which has been the hero of many a round over in the gym above the bowling alley. About the only criticism that one could offer of the fight pulled off on this occasion was that they didn't use one of the yellow dogs instead of the white Bull. In the Badger fight Detroit came to the front, with Chicago in second place, which is to be expected, since Detroit has been a leading city in enterprise for the last two years.

The biggest bunch of enthusiasm at the Face Brick convention was brought there by the Brick Club of Cincinnati, which came early and stayed late. Before starting from Cincinnati, this enterprising group called up the neighboring brick men in the surrounding territory and had them as guests at a banquet in Cincinnati, after which they all took a special car for French Lick. Arriving there they chartered a long row of rooms and a dog kennel on the ground floor and posted up a big sign telling what they were and where they were from. The group was made up of the following concerns and representatives:

The Brick Sale Co. (Don Weaver and A. W. Riggs).
L. H. McCammon Bros. (Chas. McCammon).
Moores-Coney Co. (Lawson Moores and Ed Pick).
Purcell-Grand Co. (Walter Purcell and Ed Grand).
Cincinnati Clay Products & Supply Co. (John M. Stoner).

To make life lighter and brighter and to break down the barriers of reserve and create an element of fun, a new initiating organization, known as the Ancient Order of Yellow Dogs, was turned loose on the delegates by that enterprising bunch of Cincinnati rooters. Ed Grand was leader of the pack and he was surrounded by a number of enthusiastic smellers, trailers and barkers, who made life hilarious around the corridors of the hotel and kept a continual uproar in the neighborhood of the famous Yellow Dog kennel. The Yellow Dogs have not fully completed their organization, but they have made a splendid start and we may expect to hear more of this pack at future gatherings of the A. F. A.

One of the splendid results coming from these conventions, which shows the co-operative spirit that has been generated, was manifested in the form of personal contributions of thought and enterprise for the good of others. A splendid example of this was furnished by W. G. Thomas, of Thomas Bros., Detroit, who had printed in brick red a lot of neat poster signs with Pluto on each end throwing brick, on which he had the following:

"Count that day wasted
Whose low descending sun
Sees prices shot to h—
And business done for fun."

These were accompanied by others, telling the delegates to take them home and hang them over the desk for the other fellow to see.

We are told no man is better than he thinks he is, and we are rather glad of it, for if we were all as good as we think we are a lot of reformers would be out of a job.

Written for The Clay-Worker.

AMONG PHILADELPHIA BRICKYARDS.

WITH THE MIDWINTER season here and all the brickyards of Philadelphia and vicinity operating to their fullest possible capacities, it must be said that indications as they now appear promise another good year for eastern Pennsylvania members of the clayworking industry.

Collective and individual reports received within the past several days from the Quaker City manufacturers show that a strong demand continues at this season for building brick, sewer brick and practically all allied lines of clay building materials. With this situation now prevailing and a large amount of building work, both in the planning and being started, the present activities must of necessity be continued just as long as weather conditions will permit, so that everything at this time points to an auspicious start for the new year.

Besides the existing strong seasonable demand for clay building materials for immediate consumption, local manufacturers generally report a large number of inquiries already being received upon contracts for brick to be delivered during the coming spring, and, in some instances, as late as next summer. While such is the case, the local brick producers are not displaying any great desire to book orders so far in advance, as they deem such a practice unwise in view of the uncertainty of the raw material and labor markets. Most of the Philadelphia plants report having a sufficient volume of business now on their books to keep things running smoothly so long as weather conditions will permit, and several have expressed their provisional intentions of operating their plants throughout the winter. Prices on all grades of building brick, so far as the local market is concerned, are holding firm at the recently reached new high levels. This state of affairs comes as a fitting climax to one of the most encouraging business years experienced by the Quaker City brick manufacturers for some time.

Second only to the current demand for building brick is the prevailing heavy demand for sewer brick. Few of the yards have been in a position to devote much time or attention to the production of sewer brick, in consideration of the active demand and present high prices of building brick. As a result of this condition many orders for sewer brick have, so to speak, gone begging before finding a manufacturer desiring to handle them. Under such conditions sewer brick prices in this vicinity have correspondingly advanced.

Little or no demand now exists for vitrified paving brick, and the Philadelphia manufacturers and distributers of this product have prepared themselves for a lull of several weeks' duration on the local market with regard to vitrified pavers. However, while resigned to this condition for the immediate future, manufacturers of the vitrified products in this part of the country are retaining high hopes for an early resumption of an active demand for this type of paving beginning with the opening of the coming spring's business. Philadelphia paving brick firms declare indications for a good year's business in their product during 1917 to be most promising, and are awaiting the arrival of the early spring months with a pronounced spirit of optimism.

All in all, it now appears as though two of several things are certain with regard to the local brick manufacturing industry. One is that when the totals for 1916 have been compiled this period will represent one of the best experienced by local brick manufacturers in many years, and the other is that 1917 holds forth much in the way of promise to the local trade for another good business year.

Work is now being completed upon the erection of an addition to the continuous kiln at the yard of William Conway, at Fifty-eighth and Walnut streets, Philadelphia. The new addition, when completed, will provide ten new kiln chambers to the kiln at the Conway works, and will considerably facilitate matters with this department for the expected busy season of next year.

That the automobile truck is becoming quite an important factor in the brick manufacturing industry of Philadelphia is shown in the fact that within a comparatively short time this modern delivery vehicle has been adopted by some ten or more Philadelphia brickmakers. Among the local brick firms now maintaining automobile delivery services are: H. M. & C. B. Siner, Joseph T. Byrne Est., William Conway, Keystone Brick Company, Cyrus Borgner Company, North Philadelphia Brick Works, Edward Kelley, Jarden Brick Company and Frankford Brick Works, while the Boulevard Brick Company is at this time contemplating the installation of several auto trucks in its service department in the near future.

Work is now said to be progressing rapidly upon the erection of the new tile and brick plant being erected for Col. H. C. Trexler and George K. Mosser, of Trexlertown, Pa., on the old Appel farm site on the southern border line of Allentown, Pa. The preliminary work and grading is now in progress, and from reports reaching this city it is apparent that the proposed new institution will represent a huge plant, with practically unlimited possibilities. The site of the new enterprise is deeply underlaid with an inexhaustible supply of brick clay of fine quality, which, from tests and analyses already made, has been shown to contain just the necessary qualities for the production of vitrified brick, drain tile and hollow building tile.

Business conditions with the McAvoy Vitrified Brick Company, of Philadelphia, are reported as being seasonably fair with regard to the paving brick department, but the sewer brick market was reviewed with encouragement by the firm's representative. Being located right in the midst of an iron and steel district, the McAvoy company has been experiencing considerable difficulty in getting a sufficient number of hands to enable capacity operations at its works. Owing to this handicap the McAvoy plant has not averaged more than 50 per cent. of capacity rate of operation during the past six months.

A QUAKER.

POTTERS ELECT OFFICERS AND CLOSE CONVENTION.

The United States Potters' Association, an organization with a membership of about 45 per cent. of the manufacturing potters of the country, elected officers and closed its thirty-eighth annual convention in a meeting in the William Penn Hotel, Pittsburg, Pa., December 7. The following officers were elected:

President, Charles C. Ashbaugh, East Liverpool; first vice president, William Burgess, Trenton; second vice president, Marcus Aaron, Pittsburg; third vice president, Charles L. Sebring, Sebring; secretary-treasurer, Charles F. Goodwin, East Liverpool.

The following committee reports were read: Executive committee, by W. L. Smith, of East Liverpool; labor committee, by W. E. Wells, of Newell; membership committee, by Charles C. Ashbaugh, of East Liverpool; machinery committee, by Marc Selon, of Trenton; statistics committee, by Joseph Mayer, of Beaver Falls; material committee, by Ernest Mayer, of Beaver Falls; Western general ware standing committee, by Charles F. Goodwin, of East Liverpool; kiln and fuel committee, by Guy L. Crooks, of Crooksville, art and design committee, by W. H. Phillips, of East Liverpool; manufacturers' cost committee, by Charles L. Sebring, of Sebring, O.; special representative report, by William Burgess, of Trenton.

According to Secretary Goodwin, the association did not discuss the wage agreement which will be entered into October 1, 1917. This matter will not be considered until next fall.

"Dumping" from abroad may threaten some lines of our industries, but in the brick business it is the "dumping" of some neighboring competitor that makes price troubles.

NEW HEAD FOR THE NEW JERSEY SCHOOL FOR CLAYWORKERS.

The Ceramic Department at Rutger's College, New Brunswick, N. J., has drafted Mr. George H. Brown from the United States Bureau of Standards, with which he has been connected for some years past, to fill the place as director of the Department of Ceramics formerly filled by Professor Cullen W. Parmelee, who has become associated with the Illinois University. Mr. Brown is a well-known technicist and is a graduate of the Ohio State University, securing his degree in 1909. During his course he spent two years in practical work at the Washington plant of the Hydraulic Press Brick Co. For the last seven years he has been connected with the Bureau of Standards at Pittsburgh and has been identified with many investigations and researches carried on during that time. He also is the author of a number of technical papers published by the Bureau or in the Transactions of the American Ceramic Society. Mr. Brown has been active in the industrial co-operation carried on between the Bureau and a considerable number of manufacturing plants. In this connection he acquired many friends in all parts of the country. His practical and balanced judgment enabled him to work out successfully many new problems. He was honored by the American Ceramic Society in being elected trustee, a position he has held for three years. Prof. Brown has entered upon his new duties at Rutger's College, where he expects to carry out a practical combination of research and industrial co-operation work, together with the teaching activity. Rutger's College is to be congratulated upon securing the services of Mr. Brown.

George H. Brown, New Brunswick, N. J.

THE POTTER.

Under the above title, the first issue of a monthly magazine for potters and ceramists, has been issued. It is edited by Frederick Hurton Rhead, and is published by The Pottery Publishing Co., Mission Canyon, Santa Barbara, Cal. The feature story is entitled "May Elizabeth Cook, Architectural Potter," and is illustrated with views of Miss Cook in her studio, and some of her productions. There are other interesting articles on "Crucibles and Sevres," "Bernard Palissy and His Imitators," and a series of technical notes by the editor, all of which ought to be very interesting to the operative potter and the students of ceramics. The subscription price is $3.00 per annum, single copies, twenty-five cents.

Editor The Clay-Worker:

MILWAUKEE AND WISCONSIN BRICK NEWS.

BUSINESS CONDITIONS In the clay industry of this territory are such that there are few, if any, manufacturers, jobbers and dealers who are not satisfied with the present volume of business. This section, with the advent of the cold winter months, is naturally feeling the effects of the seasonable dullness. However, conditions are much improved over a year or two ago at this time, and after a profitable season during the past months there is little cause for even a pessimist to view the situation with anything but satisfaction.

Milwaukee and Wisconsin have enjoyed one of the largest construction years, with every indication that 1917 will be equally large in volume, if not greater. In this city the month of November helped materially to increase the gain in the volume of construction authorized. There were 286 permits issued for work, aggregating in cost $1,703,180, compared with 278 permits and $1,040,357 for the same month a year ago. This has brought the total for the eleven months of this year to $13,665,764, while for the same period in 1915 it reached only $11,289,439.

Building operations in the state outside of Milwaukee are more extensive this year than ever before, according to statistics available at this time, while 1917 prospects are most bright. The present data indicate that more building projects and a greater variety are under way or contemplated than would be suspected or believed, except with the facts and figures at hand. The city of Madison takes first rank among the state cities, where projects under way or contemplated run into millions. Two buildings to cost $250,000 each will probably be put under way early next season. They are the Union Religious Center building, seating 4,000 people, and the Episcopal Church, guild hall, rectory and dormitory building, which is to provide a religious home for Episcopal students at the University of Wisconsin. Other large buildings are the new Y. M. C. A. building, to cost $150,000, and the new Madison Club building, representing another $100,000. There are numerous others from the last named amount down, of which a gratifying number will be constructed entirely or at least in part of clay products.

LaCrosse is next in line in the aggregate of building operations for the ensuing months. The state will erect a physical education building in connection with the State Normal School, for which purpose $80,000 has been appropriated. The LaCrosse Lutheran Hospital Association is to erect a $70,000 addition to the present hospital building. Garage, school and residence construction of a fair volume each will also require considerable brick and building tile. The Green Bay Packing Company has just completed a $250,000 packing plant at Green Bay, Wis., while a $60,000 cold storage building for the Green Bay Cheese Company is one of the largest jobs to be undertaken. An auditorium at Eau Claire, which will probably cost $100,000, is the principal project there, although numerous other buildings are under construction. At Racine industrial construction features the situation, including a tire factory to cost $100,000. Beloit, Oshkosh and Kenosha are also in line for considerable new work.

The year 1916 has been a banner year in the brick industry at LaCrosse, according to John J. Schnell, general manager of the Philip Schnell & Sons Brick Company, of that city. This concern is handling daily orders that are taxing the capacity of the plant, and a great majority of the brick is being used in local construction. The annual output of this concern is 2,500,000 brick. The Schnell company was organized in 1884 by Philip Schnell, who still continues as president of the concern. His son, John J. Schnell, is secretary and general manager, and another son, Charles Schnell, is treasurer. The yards and kiln are located on the State Road Coulee, about three and one-half miles from the city. The bluffs of Wisconsin on the Mississippi river furnish an unlimited supply of the finest clay for the manufacture of brick. The plant is located on the lower level, and the raw material is conveyed by gravity. The molding machine has a capacity of 50,000 brick daily and the drying sheds a capacity of over 200,000 brick. A forced draft coal-burning kiln is used. During the forty-six years that the company has been in existence improvements have been made to keep the plant modern and up-to-date. The equipment will be augmented so that the capacity can be increased if the business continues to grow at the rate maintained during the year 1916.

The first kiln of clay products to be burned at the newly erected modern plant of the Whitewater Brick and Tile Company, at Whitewater, Wis., produced fine examples of drain tile, which have met with instant favor among the consumers of that product in the vicinity. The plant was described in a recent issue of The Clay-Worker. It is the hope of the officials of the concern that the weather will be such as to make it possible to excavate for the additional kilns, which should be erected at once if the company can hope to operate efficiently during the coming months.

While the entire season has been very favorable for the drainage tile and sewer pipe industry, an appreciable amount of drainage tile is now being used, despite the cold weather and frost in the ground. Now that the farmers have concluded their fall work they have turned their attention to improvements about the farms. One of the problems of the modern farmer is drainage, and this season is very opportune to get at this kind of work. Where the ground is not easily excavated the preliminary work can be undertaken, including laying the pipe on the surface, where it can easily be sunk as soon as the ground is soft. It also allows working on the spots which are too wet and muddy for work in the warmer season. Retailers throughout the state have consequently enjoyed a short but brisk season for this clay product.

Road work is one of the main propositions taken up at the meeting of the county boards of supervisors of this state during the past few weeks, and many hundreds of thousands of dollars have been appropriated for road purposes. State aid during the present year has helped to build 1,158.75 miles of road in Wisconsin, at a total cost of $3,631,026.28. The mileage added during the last summer, and now completed, gives Wisconsin a total of 4,850 miles of state aid highway built during the last five years. There is a very noticeable lack of brick or vitrified block construction in this connection, which surely offers a fine field for the clay products industry to interest itself during the coming year and secure a portion of the large amount of work involved. In city street paving work the brick industry has made a very creditable showing, and work planned for the coming year includes a favorable percentage of vitrified block pavement among the cities which have used this type of pavement heretofore, indicating satisfaction.

A. BADGER.

A Prayer.

If any little word of mine
May make a life the brighter,
If any little song of mine
May make a heart the lighter,
God help me speak the little word,
And take my bit of singing,
And drop it in some lonely vale
To set the echoes ringing.
If any little love of mine
May make a life the sweeter,
If any little care of mine
May make a friend's the fleeter,
If any lift of mine may ease
The burden of another,
God give me love and care and strength
To help my toiling brother.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

Part VII.

Burning Behavior of Clays.

THE BURNING behavior of clays is shown by the color changes with advancing temperature, such as: Light red, red, dark red, brown, black; light red, red, dark red, dark red, etc., the red color continuing even to complete vitrification; cream buff, buff, greenish buff, green or gray; light red, buff, greenish buff, green, dark green; cream white to grayish white.

Under reducing kiln atmospheres besides the browns and gun metal blacks which we get from red burning clays, there are a number of color effects, such as saffron and dull green, besides the partially reduced products in which we have brown edges and red centers.

The flashed colors tend to the russets in buff burning clays, usually speckled with black iron spots, while the red burning clays have the browns and gun-metal blacks. The color is primarily due to the character of the clay, but the variation in color marks the progress in the burning. Burners are instructed to burn this kiln hard for gun metals, that kiln for reds, or red centers, another for a light flash, a heavy flash, bluish buffs, light or dark grays, etc., etc.

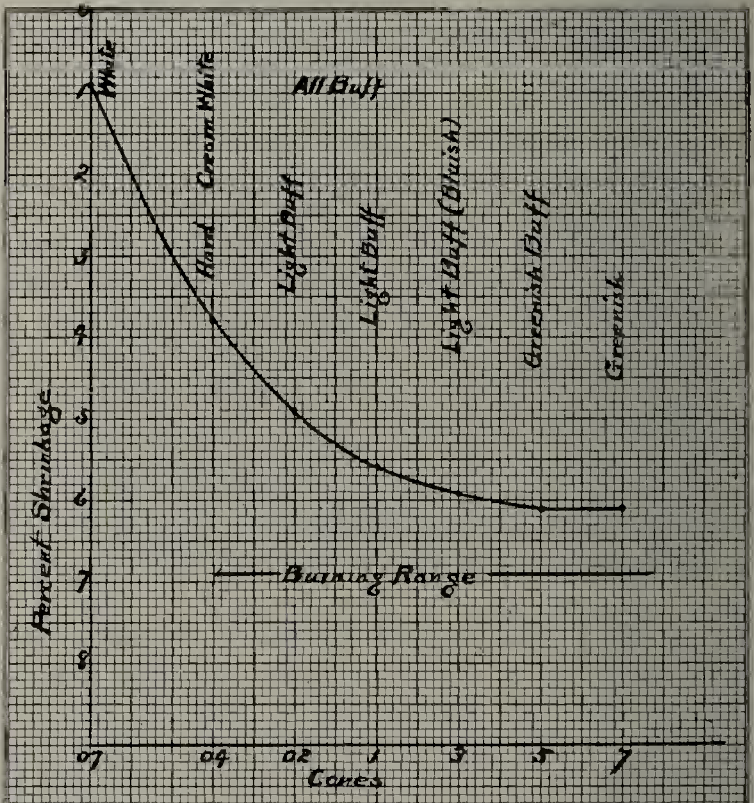
The difficulty of burning is dependent upon the character of the clay. A clay with a very short burning range requires great care in getting the temperature high enough to produce satisfactory ware, yet without exceeding the safe burning limit of the clay. Face building wares are troublesome because of the wide variety of color effects which must be produced and which require different burning treatment.

Vitrified wares require temperatures approaching the maximum limit and the only favorable factor is that each kiln receives the same treatment. Clays which are used for common wares, such as common brick, drain tile, fire-proofing, etc., are often impractical for face brick products or vitrified wares, but on the other hand, clays which are suitable for the latter products are easily burned when made into the former products.

The burning behavior of clays is nicely illustrated by their change in size under increasing temperatures, as the following illustrations show.

The shrinkage is indicated in inches on the vertical line on the left. The zero line marks the original size of the test piece. The advancing temperatures are shown from left to right on the base line and are indicated by cones.

Illustration No. 5 shows an ideal shrinkage curve indicative of the burning behavior. At cone 07 the shrinkage has advanced nearly 1 per cent. and at a rate of about 1 per cent. per cone advance in temperature. The rate of shrinkage decreases gradually until at cone 5 the shrinkage is complete and there is no change in the size from cone 5 to cone 7. We do not know how much higher the temperature could be carried without damage to the ware. The ware is steel hard at cone 04 and the burning range for all hard ware is from cone 04 to cone 7—in all ten cones and perhaps more. A burner would have to be very careless or incompetent not to get good results from such a clay.

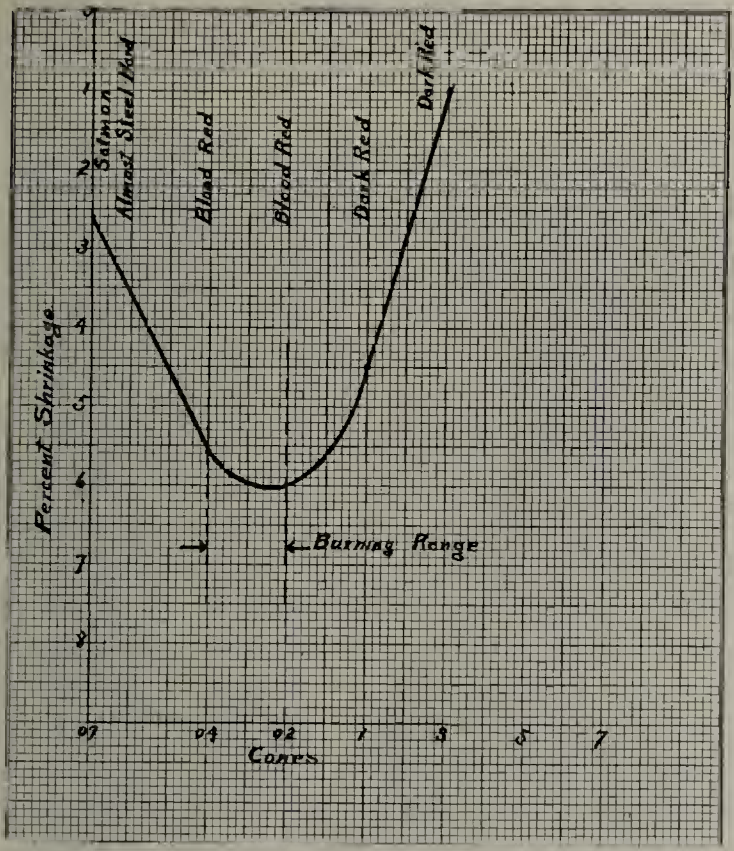


No. 5.

Compare this with No. 6. The latter begins to bond and shrink at a lower temperature than No. 5, as is evident from the fact that the shrinkage is over 2½ per cent. at cone 07. At cone 02 the curve is upward, which means that shrinkage has ceased and swelling begun. At cone 3 the sample has lost 5 per cent. of the total shrinkage through bloating. The maximum safe burning temperature is cone 02. The burning range would be from cone 02 down to some lower temperature at which salable ware could be produced.

Two cones are marked as the burning range, but this applies to the color. Common ware in which the color is not important would be available probably as low as cone 07, which would give a range of five cones. A feature of this clay is the red color which is retained through the marked fusion up to cone 3. The behavior of this clay is common to many clays, the chief difference being in the rate of the shrinkage, the suddenness of the change when the maximum shrinkage is reached, and the rate of the swelling. The first two of these differences generally determine the burning range.

No. 7 is an unusual clay. At cone 07 it is 2 per cent. larger than the original size. This increase in size is not due to bloating, but to some mineral in the clay, which has caused the increase in size by expansion. The temperature reaches cone 05 before the sample has returned to its original size, and the net total shrinkage is only 1 per cent. At cone 1 failure begins and continues at a uniform rate up to cone 5, when it would appear that the fusion has become quiet.



No. 6.

The behavior of this clay raises a number of questions in answer to which one can only speculate. What mineral could cause such marked expansion at such low temperatures? Silicious clays would have such expansion, but as a rule, silicious clays require higher temperatures to bond. It will be noted that this clay was hard at cone 07 and if the expansion is due to silica there must be associated with it some mineral which fuses at a low temperature or which develops a low temperature fusible mixture.

The bloating, as has been stated, is due to gas expansion in a fused mass but the query is, what put an end to the effect of the gas at cone 5 to cone 7. Did the viscosity of the mass decrease to such an extent that the gas bubbles could break through which would cause a collapse counteracted by the formation of additional bubbles? One can conceive of a constant size through a short temperature range under such conditions. Was a new mineral forming at cone 5 which absorbed the gas and thus preserved the balance?

The burning range of this clay for a good color would be cone 04 to cone 1, where failure begins, but for common wares the range would be from cone 1 down below cone 07, we do not know how far.

To be continued.

Motor trucks are gaining headway right along in the brick delivery business and as the streets and roads are improved their efficiency and scope of action will increase.

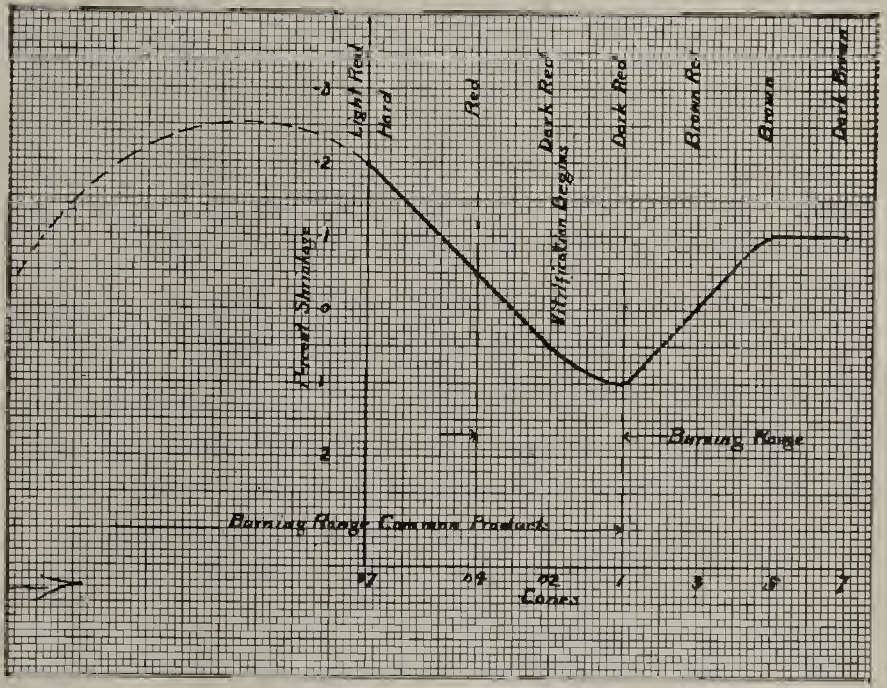
SOME TESTS OF REFRACTORIES BY THE BUREAU OF STANDARDS.

The U. S. Bureau of Standards has been a very active institution during the past year, and among other things has shown considerable interest in various branches of the clay-working industry. As was mentioned recently in these columns, it has taken up the matter of testing walls and partitions for fireproofing qualities in co-operation with various material interests.

Now we are told of a proposition taken up in co-operation with the American Refractories Association and the American Gas Institute of some work that is to be the basis of a system of classification and specifications governing the several classes of fire clay refractories.

The bureau also has begun preliminary work on another investigation dealing with a phase of the same industry, using a dolomite in certain metallurgical furnaces as a refractory. Usually the burned dolomite is placed directly in position in the furnace, with tar or some other combustible material as a binder. Where the lining was of such a nature that it had to be made of brick, magnesite brick was used. The price of magnesite brick, however, has advanced to such a degree that the use of this material has become almost prohibitive. It has been suggested at various times that dolomite might be burned in such a manner, or with the addition of such impurities that the lime present in it would not slake, except after an extended period, making it possible to produce a brick of this material which would replace the magnesite brick. The bureau, by its investigation, will determine the possibility of producing such a burned dolomite.

The bureau during last October conducted many experiments dealing with clay products and glass. In the fire brick investigation twenty-four sets of ten specimens each were prepared, corresponding to twenty-four brands of fire brick, and the results obtained were plotted. For porosity and density determinations, 144 specimens of fire brick were prepared, corresponding to twenty-four new brands.



No. 7.

In the silica brick investigation the volume of expansion of thirty-two specimens of silica brick was determined. In the investigation of the effect of calcine in fire clay bodies sixty specimens were fired, and work previously done was recalculated and checked. In the porcelain investigation two firings, a biscuit and a gloss burn, were made. In the glass investigation ten pots with and without lining were made up and a run with three pots and another set charged for fusing. Four sets of clay graphite mixtures were made up for graphite crucibles for the study of the carbon retention, due to the use of different clays. In the cement investigation 198 briquets, 24 2-inch cubes, 153 2-inch cylinders and 72 6-inch cylinders were tested. Forty specimens of terra cotta were subjected to tests.

MEETING OF PAVING BRICK INSTITUTE

Heart-to-Heart Talks on the Manufacture of Paving Brick and Economic Questions Connected with the Business.

CLEVELAND AGAIN PLAYED HOST to the Paving Brick Boosters, December 5 and 6, when the Paving Brick Institute held an unusually interesting convention in the cozy lattice room of the Hotel Statler. The attendance was very gratifying. Nearly the entire membership was represented and answered "present" when the roll was called. President Kanengeiser was on hand early and gave the sessions his undivided attention. The headliner, Mr. A. A. Holbeck, who was to present a paper on "The Use of Powdered Coal," was unavoidably absent, but sent a letter of regret and promised to present his paper on a subsequent occasion. However, the other numbers on the program were so interesting and provoked so much discussion that the time was fully occupied, the delegates having little opportunity even for lobby talks.

The purpose of the Paving Brick Institute is the dissemination of information relative to the manufacture of paving brick among the members, most of whom are actively engaged in the work as factory managers or superintendents. Hence it goes without saying that the discussions bear on the practical, everyday affairs of plant management and are extremely interesting and instructive. No stenographic reports are made and the members must attend the sessions to get the information imparted in the papers and discussions, much of which is quite valuable, consequently every delegate is prompt in attendance at all sessions. They hie to the convention hall promptly at the appointed hour and give attention to the work in hand until adjournment is declared.

The first session was devoted to routine business, appointment of committees, the report of the program committee, etc. Subsequently reports of officers were submitted, by which it was learned that the Institute is in a healthy condition, financially and otherwise. The election of officers resulted as follows: President, F. R. Kanengeiser, Bessemer, Pa.; vice president, S. C. Peebles, Portsmouth, O.; treasurer, O. W. Renkert, Canton; secretary, H. H. Macdonald, Cleveland, O.

The first formal paper presented was that on "Producer Gas in Burning Brick," by Mr. John T. Underwood, Dayton, O., which is given in full. The discussion following the paper was quite general, covering almost every phase and angle of the production and use of producer gas, and at its conclusion Mr. Underwood was tendered a vote of thanks.

THE BURNING OF BRICK WITH PRODUCER GAS.

BY J. T. UNDERWOOD, DAYTON, OHIO.

Producer Gas.

Gentlemen of the Convention:—

The making of producer gas is strictly a chemical process.

In order to understand the source from which the various gases in the mixture are derived and their method of formation, the following simple explanation of the chemical reaction is given:

After the fire has been started on the cinder bed of the gas producer and is in proper condition to receive coal for making gas and vent door has been closed, air is blown through this incandescent fuel bed from below or through the cinder bed. This air for combustion is composed of two simple elements, nitrogen, four-fifths, and oxygen, one-fifth, compose the total volume. This air in the presence of the carbon of the coal is broken up into its two elements, and the nitrogen passes through the fuel and without change appears in the producer gas mixture. This nitrogen is non-combustible—therefore, will not burn and only dilutes the combustible gases. It cannot be eliminated, consequently all producer gas contains a large percentage of it.

The oxygen of the air, having a strong affinity for the carbon of the coal, unites with it and forms what is known as carbon-dioxide. This gas will not burn, and the appearance of it in the producer gas indicates poor, weak or lean gas, and improper operation of the producer. As this carbon-dioxide, which is formed in the lower combustion zone, passes up through the less highly heated coal above, it absorbs from this layer a particle of carbon, and its nature is changed by this absorption. Here it changes from carbon dioxide to carbon monoxide. This gas is combustible, and one of the component parts most to be desired in producer gas.

It has been found necessary to inject steam along with the air into the producer in order that the heat may be kept low and the formation of carbon dioxide prevented. The steam serves a second purpose, for a portion of it, coming in contact with the highly incandescent fuel bed, is broken up into its two constituents, oxygen and hydrogen and the hydrogen without further change passes on and is found in the producer gas mixture. Hydrogen is combustible and adds value to the producer gas. The oxygen of the steam unites with particles of carbon and appears in the mixture as carbon monoxide. The volatile gases are also driven off from the freshly supplied coal by the heat below and these in turn occur in the producer gas.

This, then, is briefly the chemistry of the process, and the qualities which are most to be desired are a small volume of carbon dioxide and nitrogen, and large volumes of carbon monoxide, hydrogen and volatile gases of coal. Of the total mixture of producer gas only about 50 per cent. is combustible. The heat value of raw producer gas is approximately 150 B. T. U. per cubic foot. Producer gas contains all the elements of the coal and, therefore, temperatures equal to those secured from coal, may be obtained from it by proper application.

The Gas Producer.

The gas producer is not new; it is an old apparatus well established in the industries during the past fifty years. There are now many types of them in common use in many different lines of industry, among which are iron and steel, glass making, lime burning, the burning of clay products, etc. The type of producer used in these industries is practically the same in all and are known as water-sealed, steam blown pressure producers. These are mostly cylindrical in form, made of sheet steel, lined with fire brick and with some cast iron parts make up the whole machine. They are from six to ten and a half feet in diameter and from eight to twelve feet high.

John T. Underwood, Dayton, Ohio.

Another form of producer is rectangular, constructed almost entirely of brick except the hoppers, tuyeres, poke holes, and bracing of light angles, channels and "I" Beams. This producer is also steam blown and operated under pressure. This type recommends itself strongly by its low cost of construction and high efficiency for producer gas of high heat value. The capacity of gas producers is based on the area of the fuel bed and estimated to gasify the coal at eight to twelve pounds per square foot per hour. The character of the coal and the quality of the gas desired fix the rate of gasification. Gases which are used in the industries differ greatly in their constituents and in their quality. The heat value of the gas is one of the most important elements. Gas makers whose experience has been largely making gas for the steel industry constantly insist on running the producers under high steam pressure and a high temperature in the producer, making a very hot dark colored gas. Our own experience during the past three years has convinced us that this method of operation is not desirable in the burning of clay ware. We have learned that in the operation of producers in the clay industry we want low steam pressure, low temperature in the producer, making a heavy, rich golden-yellow gas. The dark colored gas is inclined to deposit soot in the tunnels, burn with a short flame, causing a high local heat, while the yellow gas deposits little soot and will readily burn with a very long flame, reaching far into the kiln, beyond the point of production. The rate of coal consumption per square foot per hour will be lower when making yellow gas than when making dark gas, therefore more producer area must be provided when making yellow gas. This gas will contain less carbon dioxide, hence it will have a higher heat value and prove more economical.

Underwood System.

The burning of all clay products is purely a heating proposition, and the kilns, as a whole, are the furnaces in which the ware is burned. The greatest essential feature to be desired in a kiln or furnace of this character, is the uniform distribution of the heat and the economical use of the fuel applied to secure the dessired temperature. The Underwood System produces a more nearly perfect distribution of the heat and a more economical application of the fuel than has ever been attained in any other method of burning periodic kilns.

Those experienced in burning clay ware in periodic kilns using coal, natural gas or oil in the usual way and having no true knowledge of the Underwood Producer Gas System, are always inclined to doubt the above statement. It seems, therefore, necessary to give a short description of its installation, method of operation, results obtained, and reasons why it should be installed. The Gas Producers used with this system are of the type known as pressure producers, steam blown and water sealed. They may be hand stoked or mechanically fed and stoked. The number and size of producers in any installation will depend on the daily capacity of the plant and the amount of coal required to burn the ware at the desired temperature. The gas off-takes from the producers connect direct with the main gas tunnel, which is constructed of brick, and is located entirely below the surface of the ground and extends from the producers to points near each kiln. Kiln gas tunnels are provided for the kilns, two being required for each rectangular kiln and one for each round kiln, the latter being built entirely around the kiln, except where the draft flues lead to the kiln stacks.

Spencer Duty, Cleveland, Ohio.

Special patented producer gas burners connect the kiln gas tunnels with the furnaces on each kiln. The producers deliver the gas to these tunnels under sufficient pressure to force the gas to each burner in any desired quantity. These burners have controlling valves for the regulation of the gas flow into the furnaces. They are built into the furnaces so as to prevent the flow of free air into them.

In order to supply air to the burners for the combustion of the gas, an air fan and air pipes are provided for the delivery of the air to the burners under pressure somewhat higher than the gas pressure. The air fan is located preferably, near the gas producers and may be driven by steam or electric power. In connection with the gas producers there is a regulating valve in the steam line which controls the steam at a uniform pressure. This steam regulating valve enables the operator to control with ease the rate of gasification of the coal, the quality of the gas and its pressure in the gas tunnels.

The Location of Producer.

It is desirable to locate the producers at a point as near to all kilns as is possible to prevent loss of the sensible heat of the gas; but since all gas tunnels for the Underwood System are made of brick and placed underground, very little heat is lost by radiation in regular or continuous operation. That the air fan may be given operative attention, it should be located near the producers where the men operating them can give it necessary care.

In the operation of the Underwood Producer Gas Burning System of burning periodic kilns for about three years some phenomenal records for saving time, fuel and labor have been made in burning common brick, rough texture, face brick, drain tile, roofing tile and paving block. Since these records have been made and are established facts, there must be some natural and logical reason for these phenomena in burning clay products.

During the water smoking period there is created a condition in the kiln entirely different from that obtained in any direct firing process. Both the gas and air being forced into the kiln by mechanical means, and the kiln being sealed against the flow of free air into it, there is created within the kiln a pressure greater than the outside atmospheric pressure, and by this means all draft lines within the kiln are destroyed and the heat generated is distributed evenly throughout the entire space in the kiln. When the temperature is high enough to cause rapid evaporation of the water, sufficient air is forced into the kiln to carry it off much faster than is possible with any natural or induced draft conditions. This method of water smoking has demonstrated that time has been reduced more than half over old methods. Here, then, is the first great saving in time, and fuel, and the reason is clearly apparent.

It is well known that all clays and shales contain carbon in varying quantities, which must be removed before the real burning stage can be attained. The burning out of the carbon constitutes the oxidation period and is a slow process under any draft conditions, but with the Underwood System the conditions are different, as the heated air in the kiln is under pressure and when the temperature is high enough to start oxidation or the burning of the carbon, an excess of air above that required for combustion of the gas is forced into the kiln to give all the brick such a bath of air as will increase the rate of oxidation to a point where less than half the time required under draft conditions, either natural or induced, is necessary for the completion of the oxidation period. It must be realized that during both the water smoking and oxidation periods there is always a constantly rising temperature. During these periods there is introduced into the kiln a sufficient amount of oxygen for perfect combustion of the gas, the burning out of the carbon and the carrying away of the water, and little if any excess of these requirements. No other system or method of operating periodic kilns in general and downdraft kilns in particular can produce such desirable conditions or marvelous results. These are the conditions which prevail during oxidation that afford the second point where great saving of time is secured.

Advantage of Draft Control.

The real burning stage comes after completion of the oxidation period. The temperature during the burning must be and is advanced very rapidly until shrinkage of the ware begins to take place, and from this point to the end of the burn the temperature is held with but very little increase until the finish. During the burning period the excess air is cut down to just what is required for the perfect combustion of the gas, which results in a great saving of fuel. This condition of preventing excess air entering the kiln during the burning period is a feature of burning clay ware that cannot be accomplished while burning coal, wood, oil or natural gas where stack draft or induced draft controls the burning.

Where the true natural color of the clay is to be obtained as in the manufacture of roofing tile, face brick, drain tile and other products from either red or white burning clays, a purely oxidizing fire is maintained throughout the burn. In case of burning paving block, rough texture face brick and other ware, requiring the darker colors to be brought out, a highly reducing or carbonizing fire is maintained during the latter end of the burn, and this condition may be controlled in a high or low degree of intensity in order to produce the dark colors desired. The Underwood Producer Gas Burning System is the only method by which either a perfectly oxidizing condition or a full reducing condition can be obtained and maintained throughout the full period of the burn or any part of it as desired. No other system can secure either of these conditions in all parts of the kiln during the burning of it, and both are highly essential in the perfect burning of the ware.

The following paragraph is taken from a report by Mr. P. W.

Thomas, fuel engineer for the Central Coal and Coke Company, Kansas City, Mo., who furnished the coal to the Buffalo Brick Company, Buffalo, Kansas, the report having been made to determine the grade of coal to be furnished.

"The kilns were examined for combustion of producer gas. It will be noted that the average on No. 5, taken on the 23rd, showed an excess of oxygen of 222 per cent. and 15 per cent. loss of fuel. I understand that this is necessary to obtain what is known as an oxidizing fire at certain stages of the burning. On the following day, the brick having been advanced to a more complete state, the same stack gave an average of 16 per cent. carbon dioxide, 2 per cent. oxygen and no carbon monoxide. A practically perfect burner condition is necessary to give this average. This fire was slightly reducing and more air was admitted until a slightly oxidizing flame was obtained, when the average showed 15 per cent. carbon dioxide, 2 per cent. oxygen and no carbon monoxide. These results might be considered as absolutely perfect combustion."

It is evident from this report that the claim for the presence of a large excess of air in the kiln during the oxidation period when using the Underwood Producer Gas System is absolutely true and the further claim of no excess air in the kiln during the actual burning period is proven to be equally true. What is true in these two periods must also be true during the dehydration period. The full report by Mr. Thomas may be secured on application to the writer.

The Saving in Fuel.

The claims for the Underwood System as set out in the foregoing as to burning in a shorter period of time and using a less amount of coal and a more uniformly burned product have been fully demonstrated in the many installations which have been made. The saving in fuel has been shown to run from 20 to 40 per cent. and the time saving runs from 20 to 50 per cent., with a gain of 10 to 15 per cent. of better burned ware. This is especially true in burning paving block as the top courses and those around the bag walls are not over burned or fused together and an increase of number one block is found in the bottom of the kilns. Moreover the top blocks in the kilns are sound, as they are not air cracked by any large rush of cold air into the kiln as always occurs when burning coal at the time of cleaning furnaces, which must be done at least twice every twenty-four hours. Further, there is no deposit of ash and cinder burned into the top course, as is usual with coal burning, but are clean and may be shipped to the job as number ones.

It is most interesting to note that little, if any, repairs are needed to the furnace or other parts of the kilns, which is due to the fact that producer gas does not produce a high local heat in the furnaces, but burns with a long flame in the interior of the kiln among the ware. This feature represents a great saving in the kiln repair account.

The extended economies which have been shown by the Underwood System in the past three years stamps its permanent establishment in the clay industry and the continual advance in the price of fuel brings a constant and stronger demand for the system in order to hold down the cost of manufacture.

At the present time there is a lack of knowledge and skill in the clay industry regarding producer gas, its production and use and the gas producer and this is the most serious obstruction to overcome to make the Underwood System universal in its use. We need the support of the leading brick manufacturers in a campaign of education along this line through which all interested in the clay industry must profit. (Applause).

"Equipment Efficiency" was the topic of an able paper presented by Chairman Kanengeiser. It, too, is given in full, and we regret that we are unable to reproduce the discussion, for it elicited much valuable information on points not usually brought out in convention talk.

EQUIPMENT EFFICIENCIES.

BY FRED R. KANENGEISER, BESSEMER, PA.

Gentlemen of the Convention:

The equipment in and about paving brick plants is very largely of the same general character throughout the industry. We all use the same general type of brick machine, pug mill and drypan, dryer car and transfer car. The belt drive is in universal use whether actuated by an engine through a line shaft or by a motor. The belt conveyor seems to be a fixture about all paving brick plants and now many plants are using crushers of various types as primary breakers in reducing their raw material.

It is then a study of the efficient operation of such equipment which I hope to present here today, the field is broad and any attempt to deal with every phase of the subject as related to paving brick plants would require far more time than I feel permitted to take.

The subject of scientific management of industries, so much discussed and yet so little understood generally means to me nothing more or less than the study of exact facts as related to any specific process, an analysis of their causes and then a cure of the same if defective.

The equipment at hand for performing any specific work must come in for a cross-examination and must show cause why it should exist. If it is fundamentally correct, defects of detail are usually easily remedied. If not correct, it should be replaced with equipment which will give the service required.

The equipment on any brick plant may be classified as follows:

Prime movers and accessories.
Power transmission machinery.
Conveying machinery.
Forming or making machinery.
Drying and burning equipment.

I wish to discuss each of these subjects, some briefly and others more fully.

In most plants the power is furnished by a simple engine working on low pressure steam, while a few plants have installed electric drives throughout, either generating their out power or purchasing it from a power company when a satisfactory rate can be obtained; still others use both forms of power, driving the main parts of their machinery through a line shaft and their outlying equipment with motors. It is not our purpose to enter into a discussion of the cost of power but it is our purpose to make our existing equipment as efficient as possible. We know that any one of the above methods of power generation is fundamentally correct, and that while one may cost slightly less than the other, the difference in cost will not warrant a considerable investment, and therefore, will be adopted only as it makes for more flexibility or convenience. Let us then be content with the power at hand, but make the power plant ready for service every minute of every working day.

First, we must see that the boiler water is as nearly correct as possible. Open feed water heaters are on the market, in which the water may be treated hot, which is the most efficient way to treat it—thus the boiler tubes and shell may be kept practically free from scale and corrosion and present the least resistance to heat penetration, and of course, the natural result of less fuel consumed will follow. A good make of shanking grate bar should be used, for such a grate bar will save coal and labor. All pumps should be carefully packed. The writer has personally found leaky packing which was losing as much as 5,000 gallons of water per day, the cost of this water for a single day would cover the cost of time and packing to remedy the condition. Steam lines and valve stems should all be made tight and covered with Mg. asbestos covering, for the loss of steam at ninety pounds, through a one-sixteenth inch hole is equal to the loss of one horsepower per hour, and the radiation of heat from steam pipes not covered is 2.7 B. T. U. per square foot per hour per degree difference in temperature; while with Magnesia asbestos covering, it is .35 B. T. U. per square foot per hour per degree difference in temperature. This simply means, that on a boiler plant running 50 per cent. efficient using 14,000 B. T. U. coal with steam at 100 pounds pressure a loss per hour of 8.96 pounds of coal for each 100 square foot of exposed pipe.

Fred R. Kanengeiser, Bessemer, Pa.

2.7 minus .35 equals 2.35 B. T. U.

337 degrees temperature of steam minus 70 degrees temperature of atmosphere equals 267 degrees.

2.35 times 267 equals 627 B. T .U. per foot, or 62,700 B. T. U. per 100 feet.

50 per cent. efficiency times 14,000 B. T. U. equals 7,000 B. T. U. per pound effective.

62,700 divided by 7,000 equals 8.96 pounds coal lost per hour.

Then, the engine should be kept in tune at all times. No engine room is complete without an indicator and the indicator should be used at least once a month and the valves governed accordingly. An Orsat apparatus should be used to control the combustion or better still, a CO_2 recorder if you can afford it. Nearly all engines are far enough from the boilers so that a steam separator is essential, the water from which should return to the feed water heater. We have thus covered briefly the main points which make for efficiency of equipment in the simple engine power plant.

The transmission of power through line shafting and belts is frequently the source of very heavy losses and even under the best conditions take a heavy toll from the boiler fuel pile. The amount of power thus used runs under good condition as high as 17 per cent. of the total power generated.

If then we find on our hands a line shaft, jack shafts, counter shafts, belts and pulleys let us examine carefully that they may be fundamentally correct. Our line shaft first: Is it level? Is it in line? A good contractor's level and a level rod, or better still, a rod made especially for reading levels on a line shaft will tell whether the shaft is level and the information can be obtained in a very short time. To learn whether a shaft is in line we prefer to run a line with a transit twelve or fourteen inches from the shaft and parallel to it, setting a nail permanently into each pier. A steel scale square and machinist's level will tell the story very quickly. Having obtained something to work from there is positively no excuse for permitting the misalignment of the main shaft. Now study the layout of counter shafts and jack shafts with a view to eliminating shafting and boxes. Are the machines grouped so that the least amount of shafting is used? Can you drive that conveyor direct from the line shaft and cut out that jack shaft? Do so, if possible. Don't try to run a belt around a corner, the belts don't like it and besides it is offensive to the aesthetic taste of the mechanical engineer. The friction loss for each bearing is considerable, and if out of line is naturally multiplied. The bearings used should be examined from time to time to see that the babbit is full and in place. It does seem absurd to offer such advice to intelligent men, but I have personally been on Paving Brick plants where one could see by only casual examination that shafting in various uses had worn into the cast iron of the boxes and that there was room enough between shaft and cap to insert ones finger if you cared to take the risk. What excuse in the world can be offered for such conditions? Such inefficiency of equipment costs money for every minute of every day as long as it exists.

Care should be taken in the selection of pulleys, a split cast iron pulley, generally speaking, seems to give the best results, although wood split pulleys are quite satisfactory where conditions are dry. Very fine, dry dust seems to be very detrimental to wood pulleys, inasmuch as it penetrates into the smallest opening, and being dry acts as an absorbent, thus accumulating moisture and softening the glue. Place the pulleys with care, see that they are tightened evenly and squared with the shaft. Time spent on this job is well spent if intelligence is used.

We now come to the belts—our most annoying problem. The belt salesman makes life miserable by his arguments of superiority for his brand, arguments which, by the way, can't easily be proven and probably never are. If he would talk application of belts more and 32 oz. duck less, most of us would be far better off both mentally and financially. In applying the belt, attention must be given, first to the size of pulley then to the belt center, then to the belt, and last, but by no means least, to the belt fastener. It must be remembered that horsepower is transmitted through a belt due to its arc of contact and its width and not due to the number of square inches of contact. The adhesion of a belt to its pulley is independent of the pulley diameter. To quote from Kent's Hand Book for Mechanical Engineers.

"A belt will slip just as readily on a pulley four feet in diameter as it will on a pulley two feet in diameter, provided the conditions of the faces of the pulleys, the arc of contact, the tension and the number of feet the belt travels per minute are the same in both cases."

Various factors are used to determine the pulley size best suited for a given drive 600 feet to 1,000 feet per minute per one inch of width for a four-ply belt on 180 degree arc of contact indicates the range used by competent engineers. 1,000 feet per minute per one inch of width per horsepower is used by Frederick W. Taylor and will check out very satisfactorily in practice. The pulley diameter should be large enough to protect the belt from damage, due to excessive bending and should increase with the thickness of the belt. Some authorities claim that nine inches is the smallest diameter on which a four-ply canvass belt should be used, but the writer would much prefer to use not less than a twelve-inch pulley for a four-ply belt. The most efficient belt speed is from 4,000 to 4,500 feet per minute, and the best belt centers 20—25 feet, nothing being gained by increasing belt centers.

In tightening belts care should be exercised that too much is not taken out, two inches per ten feet of length of canvas should be sufficient, while one inch per ten feet of length for rubber is enough.

The belt fastening, generally speaking, has about one-half the strength of the solid belt, and therefore may be a source of very serious trouble. So in designing your belt installation allow a factor of safety of three for the weakness of joint. Most fasteners offered in market are reasonably satisfactory when belt has the proper design, but the writer has had most general success with the plate and rivet type and the plate and bolt type. The hinge type of fastener while preferable, due to its flexibility, is no doubt the weakest fastener which we have.

Belts should be given continuous attention to keep them soft and pliable, since a pliable belt will transmit horsepower with far less slippage than a hard, dry belt and will remain in service much longer. I have in mind an engine drive belt which had given ten years' service, but had not been given all the attention it should have received. The belt looked bad and a new one was ordered to replace it. After receiving the new belt, it dawned on us that perhaps we had not given this belt necessary attention. We forthwith attained from the manufacturer of the belt a small can of the material with which the belt was originally filled. One damaged ply was removed and the belt treated. To make a long story short, the new belt remained in our store room for over five years before it was necessary to remove the original belt. Thus the life had been prolonged 50 per cent. but with very little cost.

The character of belts to use is of very great importance and can best be decided by the individual user.

Canvas belts are offered on the market which are of very good quality, are much lower in price than other grades and in many places around a brick plant, give better length of life and are, consequently, much more economical.

Woven belts do not hold a fastener, and while very desirable for small pulleys, due to their construction, are expensive and generally unsatisfactory.

Rubber belts are best under dusty conditions. The dust will fill a canvas belt and make it very hard and slippery.

But one point stands out paramount in our experience—no matter what the make of belt—or what its cost may have been—good service cannot be obtained unless it has been properly applied.

Conveying equipment must be considered as that equipment which conveys material in and about a brick plant and may consist largely of belt conveyors, bucket elevators, or cars. We wish to touch each of these subjects as briefly as possible and yet bring out what we considered to be a fundamentally correct design and operation.

We have had a long and varied experience with belt conveyors, a great deal of it disappointing but we feel that we have at last come into the light and now know how to build, operate and maintain a fundamentally correct conveyor. The conveyor which we believe to be best suited for any conveying purposes must have two fundamental ideas worked into it. It must be correct in design and it must have a proper feeding arrangement.

To be correct in design, it must be so built that it will carry material at rest on its upper surface not along its sides or underneath. The material at rest will not fall off, will impart no wear to the belt and will be delivered to its destination in a quiet and orderly manner.

At this point we wish to divert a little and warn against the type of conveyor called the drag belt or box conveyor. This can have but one excuse for being, and that is expediency.

It is expensive in maintenance and a power eater. It wears the belt on top, sides, bottom and edges, and is otherwise unsatisfactory. There is only one place that I believe its use to be justified and that is in conveying waste cuts from the off bearing belt.

The width of the belt should be determined by the quantity of the material and size of pieces which it is desired to convey. As the size of pieces of material increase the belt width must increase. Having decided upon the width of belt, select a good concentrator, do not use cheap equipment of this character. We personally prefer the ball-bearing concentrator because of its light weight and better control of lubrication. We have found that it will outwear many times over another type which we have used; largely, we believe, because it is always lubricated.

Concentrators should be set so that the concentrating roller stands at an angle of not more than 15 degrees with the horizontal, they should be placed not more than five feet apart, although we prefer to set them four feet apart. The head and tail drum should be of ample size to pull the load. A take up must be provided, and where space permits, the gravity take up is undoubtedly the most satisfactory. It is our practice to place a board floor between the upper or carrying side of belt and the return side of belt. This floor is about eight inches from the upper side of belt and projects beyond the belt on both sides, thus all chance of spilling material onto the return belt is eliminated.

Ample space must be provided on both sides of the belt to allow easy and careful inspection. We are now ready for the material. "Aye, there's the rub" for how much time and money we have spent worrying along with improper feeding or delivery arrangements, and yet how simple it is when it has been properly arranged.

We have designed a chute which we use on all types of conveyors in both branches of our business. This chute is made of steel plate, is set at an angle of 45 degrees throughout two-thirds of its length; the angle is then broken to 22½ degrees for about one-fourth of its length, then a flat lip which is adjustable is inserted. In case the material is very uniform, the adjustable feature is omitted. The sides of chute, which begin at full width of delivery opening, are then drawn in, so that they are one-half the width of belt apart when the chute reaches the belt; the sides are extended along the belt in the form of wings which slightly diverge, the material then reaches the belt without battering or bruising it; is placed on the center of the belt and when clear of the sides of chute, lays on the center with the edges of the belt clean and with no chance of edge wear.

The speed of belt must be given some attention, for a belt which runs too rapidly throws the material about, while when run too slowly its capacity is materially decreased. It is our experience that conveyors around a clay plant should run at a speed of 225—300 feet per minute.

We herewith wish to cite some experiences in connection with belts used to feed dry pans and running in pits under the floor of a storage bin.

We have selected the records of four belts which worked under the old form of construction and in which improper methods were used to deliver material to the belt and in which the conveyor was improperly constructed. Our old style conveyor installation was what you might call a guessing proposition. We guessed it would run all right.

Following is a table which sets out very clearly the increased life of belt and the saving in cost between the two forms of construction. One belt is now doing the work that two belts formerly did and bids fair to last two or three times as long in point of time.

Kind of Belt	Length Feet	Width Inches	Ply	Speed F. P. M.	Life	Cost per Ft.	Cost per M per 100 Ft. of of Length	Remarks
Cotton Woven ...	615	18	6	390	1 yr. 3 mo. 2 da.	$1.77	.0222	Made 8,000,000 10-lb. block.
Canvas	410	20	6	53.4	1 yr. 9 mo. 4 da.	.825	.008	Made 10,500,000 10-lb. block.
Canvas	408	18	6	162	1 yr. 8 mo. 8 da.	.757	.0071	Made 10,600,000 10-lb. block box or drag conveyor belt worn to average width of 10 inches when removed.
Canvas	410	18	6	414.7	1 yr. 1 mo. 10 da.	1.33	.019	Made 6,725,000 10-lb. block.
Canvas	500	18	6	301	1 yr. 25 da.	.....	.....	This belt was almost ready to throw away, put on under new construction gave 1 yr. 25 da. additional service. Made 21,000,000 on new equipment.
Cotton Woven ...	500	20	6	301	put on 3-21-1915	1.27	Cost to 12-1-1916 .004	New belt, new conveyor. Made to 12-1-1916, 30,621,000 10-lb. block. Shows no edge wear, no surface wear.

Bucket elevators should be treated the same in principle as conveyors.

Dryer cars, the principal car used about a brick plant, should be given sufficient weight in design to stand the jars and strains in handling the load from stub to transfer, etc.

The wheel and box in particular should be amply heavy.

To go into all the ramifications of the subject of "making" machinery, would require much time. We will, therefore, endeavor to be brief and touch only a few points.

In selecting a crusher, it is well to remember that the car carrying the material to the crusher should be turned as quickly as possible. The crusher then should have ample capacity.

To obtain capacity, each type must be considered on its merits. Do not forget that any crusher which depends upon gravity for clearance is unfit for crushing shale. Shale is not rock, it is plastic or semi-plastic material and will sooner or later clog a jaw or gyratory crusher, thus causing delays, annoyances and loss of production.

A roll is then the proper crusher to use. A single roll breaker for coarse or heavy material, a double roll for finer material.

The capacity of a roll is governed by its theoretical ribbon (area of opening times peripherial speed). No such capacity can even be hoped for from a gyratory or jaw crusher.

I recently saw a beautifully built paving brick plant, every detail complete, labor saving arrangements on all sides, one man feeding four dry pans, then we went to the crusher. Four men were required to poke 275 to 300 tons of shale through a 1,000-ton capacity crusher. After all that I had previously seen, this was certainly disappointing.

Now, a few words on the balance of the "making" machinery. This equipment makes money for the owner only as it runs full time.

The machine must first be kept true and in line, must have its bearings full and in good condition. Then the wearing parts should be studied with a view to obtain maximum wear. The use of manganese has prolonged the life of dry pan screen plates very much indeed; the use of the hardened auger and knives in the brick machine, while higher in first cost, give much greater life; this preventing possible break downs or slowed down production. These hardened augers retain their size, thus make for continuity of quantity output, and thus for efficiency of equipment which is the point which we are striving for.

When we have covered our plant thoroughly and well, when all our equipment is running right, we are ready for the next problem—Labor. But we cannot meet the labor problem with inefficient tools and equipment, for what workman has any incentive to better work in a factory where tools are inadequate, machinery is continually breaking down, power is off or the supply of material has run short.

It has been our object in this paper to call attention to the details of equipment, to the imperative need of intelligent design and arrangement and to impart what little knowledge we have acquired on the subject.

Details—that frequently maligned word without which no mighty dream can ever be realized, no railroad can successfully cross our continent and no brick plant can successfully run, therefore, don't guess at details, get the facts, the cause and effect. Detach yourself from your own plant and look at it as a stranger would.

Analyze it, then you will see it as it is and soon remedy the evils that exist and obtain the continuous operation which makes so much for satisfaction to the men, the management and the owners, and is in our mind the surest road to that coveted goal—the dividend. (Applause).

At the final session Spencer Duty spoke extemporaneously on "The Development of the Bonus System," telling in an interesting way of the experiences of his company in efforts to increase the capacity of its plants by the payment of bonuses to workmen. This scheme proved quite successful, and was especially helpful during the past season, when all plants suffered from the scarcity of labor. We are promised a full copy of Mr. Duty's remarks for a subsequent issue.

The last paper of the series was that by Mr. George W. D. Orr, of the Purington Paving Brick Company, Galesburg, Ill., on the subject of labor, which demonstrated that Mr. Orr has given a great deal of study to this all-important problem.

LABOR.

BY W. G. D. ORR, GEN. MGR., GALESBURG, ILL.

Gentlemen of the Convention:

In my opinion the labor situation is the greatest problem facing the American manufacturer today, and to the manufacturers of paving brick it is especially serious because our costs depend almost entirely on the cost of two items, coal and labor.

It is therefore the duty of this Institute to make an exhaustive investigation of all reasonable methods suggested which promise economy in the consumption of either element. Unfortunately most of the experiments made on brick plants are not recorded. Those that are successful are sometimes adopted, but the failures are lost, and I am sure that many of the so-called failures could have been carried to successful conclusion had an authentic history of experiments been kept. Such a history would undoubtedly show that some experiments had been made hundreds of times. They will probably be made time and again until more scientific records are kept. For instance, at the present time we are all interested in the development of powdered coal and producer gas as applied to burning brick. I know of one paving brick company burning periodical kilns with producer gas, and none using powdered coal. If for some unforeseen reason the company using producer gas should abandon the scheme, I say unforeseen reason because I have recently inspected the installation, and believe from what I learned, that it has solved the particular fuel problem confronting that company. But should they give it up, the knowledge gained of their experience would be lost to the industry.

An experiment with powdered coal will cost considerable money—so much perhaps that no single company will care to make it until face to face with a fuel crisis. However, the experiment should be made and made at once, and I suggest that it be done at the expense of this Institute, or with a fund collected from our members, and that such records of the experiment be kept that we will be able to judge for ourselves whether or not the system is adaptable and advisable for each or any of our particular needs.

I speak of these two cases because they are the main subjects up for our attention at this meeting. But the same principal of experiment and record applies to our labor problem as much as to machinery, equipment and fuel.

Hardly any of us pay the same wage for the same job, and probably never will do so, on account of the varying conditions to be met on our plants, but the sense of proportion does not vary beyond the point where we could and should make intelligent comparisons of wage scales and working conditions.

In some plants the wheelers are paid more than the setters; on others the reverse is the case. On some plants the pug mill man gets more than the man who attends the brick machine, and vice versa, but when the time comes for an adjustment of wages, the cases where your competitior is paying more in one particular department than you are, will have more bearing on the settlement than the cases where your wages are higher than your competitors.

Mr. C. C. Barr suggested a few days ago that wage comparison should be made. I heartily agree with him, and think we should go farther. I believe and suggest to this Institute that all members should send their complete wage scale to our Secretary and with the wage scale an explanation of the work required of the employe in each department. For example, after giving the setting rate, the accompanying statement should show whether or not the rate includes sanding and trucking. After giving the wheeling rate, it should show whether or not the wheelers are required to lay and build their own run. The scales should be tabulated in such a way that they can be compared. If this suggestion is followed, we will all be in a better position to meet the constantly increasing demands that are being made upon us.

Wages will not go back to any great extent when the present abnormal conditions have passed. There may possibly be a slight reduction, but past experience has taught that labor usually holds its own. The present general demand for shorter hours is just as serious to us as the high rates, and if we expect to meet both issues successfully, we must co-operate.

The general impression held by the public is that brick yards are so inefficiently operated that any sort of a man is good enough to work on them. I read a few days ago that the Emperor of the Germans suggested that war cripples be put to work in brick and tile factories. We all know that there are few places for cripples on the modern brick yard. Some employers even insist that all men pass a physical and medical examination before being employed, and in states where Compensation Laws are in force, it is the proper precaution to take.

We must not only make every effort to correct these false impressions, but must make the changes necessary to put the right man on the right job, and thereby make employment on brick yards more attractive and more profitable.

I received a letter a few days ago from one of our trade papers asking if the law in the state of Illinois required brick plants to install wash rooms for their employes. They had received a letter from one of their subscribers asking the question. It undoubtedly was the intention of their subscriber to refuse to install wash rooms unless the law compelled it. I replied saying that I was not sure that the law made it necessary, but that common decency did. This is merely an example which shows that the employers, as well as the employes, need educating to meet modern conditions, and we must work to the end of educating ourselves and our employes to the understanding that our goal is mutual. Otherwise the present spirit of reprisal will continue to gain impetus.

Organized labor proposes by unregulated force to have its own way, of which we have recently had an example in the passing of the Adamson law, and Mr. Gompers has said that they are going to get it. Please mark his words, "Law or no law."

Let us from now on be so organized and truthfully informed by each other, that we will be the better prepared to defend ourselves and retain for the industry the position of prominence which it deserves. (Applause.)

At the concluding session a vote of thanks was tendered Secretary D. C. Wilcox, of Alliance, O., for faithful service rendered during the past year, and to those who had contributed papers for the benefit of the Institute. Some minor changes were made in the constitution and it was agreed to meet semi-annually in the future, instead of quarterly, as was originally intended.

The convention closed with an informal banquet, at which Judge Piere White, of the Cleveland Municipal Court was the chief speaker. Spencer Duty officiated as toastmaster, and the Judge proved a very entertaining orator, dwelling chiefly on the futility of inculcating morals by legislative enactment.

Those in Attendance.

C. C. Barr, Barr Clay Co., Streator, Ill.
J. Brennan, Barr Clay Co., Streator, Ill.
C. C. Blair, Bessemer Limestone Co., Youngstown, O.
W. D. Thomas, Bessemer Limestone Co., Bessemer, Pa.
F. R. Kanengeiser, Bessemer Limestone Co., Bessemer, Pa.
Paul Kanengeiser, Bessemer Limestone Co., Bessemer, Pa.
R. C. Wallis, Bessemer Limestone Co., Bessemer, Pa.
C. L. Weaver, Bessemer Limestone Co., Bessemer, Pa.
Arthur L. Bowers, Burton-Townsend Co., Zanesville, O.
S. M. Duty, Medal Paving Brick Co., Cleveland, O.
H. A. Ford, Medal Paving Brick Co., Cleveland, O.
F. E. Shultz, Medal Paving Brick Co., Cleveland, O.
Herbert Moatz, Medal Paving Brick Co., Cleveland, O.
W. R. Barnhart, Medal Paving Brick Co., Cleveland, O.
C. J. Deckman, Medal Paving Brick Co., Cleveland, O.
M. E. Gregory, Brick, Terra Cotta and Tile Co., Corning, N. Y.
R. B. Keplinger, Metropolitan Paving Brick Co., Canton, O.
O. W. Renkert, Metropolitan Paving Brick Co., Canton, O.
Allen B. Kline, John Kline Brick Co., Wickeliffe, O.
J. C. Kline, John Kline Brick Co., Wickeliffe, O.
F. L. Manning, Peebles Paving Brick Co., Portsmouth, O.
S. C. Peebles, Peebles Paving Brick Co., Portsmouth, O.
W. G. D. Orr, Purington Paving Brick Co., Galesburg, Ill.
W. H. Terwilliger, Purington Paving Brick Co., Galesburg, Ill.
Otto Springe, Purington Paving Brick Co., Galesburg, Ill.
E. L. Sweat, Purington Paving Brick Co., Galesburg, Ill.
D. C. Wilcox, Alliance Clay Product Co., Alliance, O.
Prof. R. T. Stull, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
F. B. Dunn, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
Mr. Perkins, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
T. A. Randall, The Clay-Worker, Indianapolis, Ind.
Mr. Bossel, Newburg Brick and Clay Co., Cleveland, O.
J. R. Zmut, Newburg Brick and Clay Co., Cleveland, O.
C. P. Mayer, Mayer Brick Co., Bridgeport, Pa.
Marion Blair, Thorton Fire Brick Co., Thorton, W. Va.
C. U. Hendershot, Cleveland Brick and Clay Co., Cleveland, O.
John Hall, Westport Paving Brick Co., Baltimore, Md.
G. O. French, Big Four Brick Co., Canton, O.
W. H. Luchtenburg, Hocking Valley Brick Co., Columbus, O.
M. B. Greenough, Case School, Cleveland, O.
D. E. Humphrey, Portage Engineering Co., Akron, O.
I. M. Justice, Manufacturers' Equipment Co., Dayton, O.
John Underwood, Manufacturers' Equipment Co., Dayton, O.
Mr. Carr, Manufacturers' Equipment Co., Dayton, O.
W. W. Meddick, Ohio Ceramic Engineering Co., Cleveland, O.
F. R. Mahurin, formerly with Arnold-Creager Co.

BRICK AND MORTAR TABLES SUPPLY BASIS FOR ESTIMATING MATERIAL IN BUILDING.

For the information of those who contemplate building operations, William B. Wreford, manager of the Detroit Brick Manufacturers' and Dealers' Association, has compiled figures showing the number of brick required for one square foot or one square yard of wall of different thicknesses and the quantity of mortar necessary to lay 1,000 brick with joints of various specified thicknesses.

The number of brick required for square foot and square yard in walls of different thickness is as follows:

Wall.	Sq. ft.	Sq. yd.
Four inches, veneer	7	63
Nine inches, solid	14	126
Thirteen inches, solid	21	189
Eighteen inches, solid	28	252

The standard size brick, 8.25x4x2.25 inches, is used as the basis of the foregoing table, the brick being laid with mortar joints, one-fourth of an inch thick, each brick and the mortar beneath being calculated as having thickness of 2.5 inches.

The quantity of mortar required for each 1,000 brick, with joints of different thickness, is estimated as follows:

Joint Thickness.	Mortar, Quantity.
Three-sixteenths inch	8 cu. ft.
One-fourth inch	10 cu. ft.
Five-sixteenths inch	12 cu. ft.
Three-eighths inch	15 cu. ft.
One-half inch	18 cu. ft.
Five-eighths inch	22 cu. ft.
Three-fourths inch	26 cu. ft.

To lay 1,000 brick in lime mortar with proportions of one of lime to five of sand, and joints three-eighths to one-half inch, requires three bushels of quicklime and 18 cubic feet of sand.

To lay 1,000 brick in Portland cement mortar, in proportions of one of cement to three and one-half of sand, and joints three-eighths to one-half inch, requires one and one-quarter barrels of cement of five sacks and 18 cubic feet of sand.

QUESTIONS OF INTEREST TO CLAYWORKERS

ANSWERED BY J. J. KOCH.

QUESTION—Will you please inform me of the possible value of our clay as per following analysis:

Silica	74.6
Alumina	16.72
Ferric (iron) oxide	.40
Calcium oxide	.18
Magnesium oxide	(trace)
Sulphur trioxide	1.55
Titanium	.53
Sodium	.21
Potassium	.82
Loss on ignition	5.04

Answer—To get at kiln condition of the clay during the higher heats we will assume that the sulphur trioxide is eliminated and the loss on ignition is not to be counted. Thus we have the following proportions at such a time:

Silica	79.85
Alumina	17.89
Ferric oxide	.42
Calcium oxide	.19
Titanium	.56
Sodium	.22
Potassium	.87
	100.00

The first step would be to apply calculation factors for determining the kaolin and feldspar contained in the clay, as shown by "Dana."

Potash feldspar=16.9 potash, 18.4 alumina, 68.7 silica.
Soda feldspar=11.8 soda, 19.5 alumina, 68.7 silica.

Or, by factoring the above table, we have:

Feldspar.

Alumina for potash=% potash×1.0888
Silica for potash=% potash×3.8284
and
Alumina for soda=% soda×1.6525
Silica for soda=% soda×5.8221

Kaolin.

Deprived of all its water, kaolin would resolve itself into:
Silica 54.07, alumina 45.93—or factor—would be:
Silica for alumina=% alumina×1.1772

Potash Feldspar.

Potash 0.87×3.8284 silica =3.330 silica
Potash 0.87×1.0888 alumina=0.947 alumina

4.277
0.87 potash

5.147 potash feldspar

Soda Feldspar.

Soda 0.22×5.8221 silica =1.281 silica
Soda 0.22×1.6525 alumina=0.363 alumina

1.644
0.22 soda

1.864 soda feldspar

Alumina.

Contained in the clay		17.89
Contained in the soda feldspar	0.363	
Contained in the potash feldspar	0.947	1.311
Alumina available for clay substance		16.579

Clay Substance.

Alumina 16.579×1.1772 silica 19.515 silica
Alumina 16.579

36.094 clay substance

Adopting the silica equivalent, as in feldspar, we find there will be utilized in—

Calcium oxide ...0.19×3.214=0.610
Ferric oxide .....0.42×1.125=0.472
Titanium oxide ...0.56×2.2 =1.232

1.17 +2.314=3.484 binding material
Soda feldspar 1.864
Potash feldspar .. 5.147

7.011 7.011

Total binding material..........10.495

Thus the burned product would utilize silica as follows:

For—Clay substance	19.515
Soda feldspar	1.281
Potash feldspar	3.330
Binding material	2.314
	26.44 and,

Silica 79.85—26.44 utilized silica, leaves 53.41 free silica, resulting in the following products:

Clay substance	36.094
Free silica	53.41
Binding material	10.495
	99.999

Resume.

From the above it can readily be seen that:

The percentage of binding material is rather small compared to the quantity of clay substance and free silica present, hence it will take a high temperature to burn the clay satisfactorily.

The small proportion of iron present indicates a pale red color at the lower heats—will turn to a considerably paler (cream) color with increasing temperatures.

The free silica present indicates that the product can be used as a fire brick material under certain conditions.

The workability of the clay will in a great measure be dependent upon the physical condition of the material, of which there has been no mention made.

UNIFORM BUSINESS SYSTEMS.

Uniforming or standardizing systems of business and especially business accounting to fit an entire industry is going a step or two beyond the fitting of system to business. This is an important step, too, that the Federal Trade Commission proposes to help us take.

For quite a number of years now our accounting experts have been talking and teaching system and efficiency. Some have devised what might be termed cure-all systems of accounting and offered them for every kind of business. The more enlightened have turned toward the idea of fitting cost systems and other accounting methods to each business so as to better meet the exact requirements in individual cases.

This was undoubtedly a step forward, but there is now another step before us, that of standardizing or uniforming accounting methods or business systems among all those engaged in a common business or industry. The idea of it is not only to simplify the work of each, but also to bring more understanding so that each working with the same system of accounting will arrive at more nearly the same conclusions as to cost, and get results which will enable them more easily to compare notes with each other and exchange information and will also make it easier for the bankers to understand conditions in an individual industry which may apply for financial assistance.

It will take time and require the co-operation of business men through their organizations, but it can be done, and in the end the uniforming of business systems in the industry should result in material benefit for all concerned as well as lessen the problem of proper accounting.

OBSERVATIONS OF A PACIFIC COAST CLAYWORKER TRAVELING EAST.

"NO FRAME BUILDINGS Inside the City Limits." That sounds good to a clayworker. I had to ask it over again, and suggested for city limits "inner fire limits," but it was plain city limits. If all American cities had such a slogan would not the claycraft rejoice? Such is the case in Denver, Colo., and it must be said the city has benefited by it to a great extent. It stands to reason that there should be many clay plants in such a community, and there are—many of them—mostly dry-press brick plants, for evidently any kind of dirt makes brick in Denver. Dirt from city lots, dirt from the streets, dirt from the hills—everything touched by clayworkers is turned into clay products. Of course, these bricks are principally common brick. There is a vast variety of face brick of all colors and shades—reds, browns, buffs, flashed, light cream brick, also glazed brick, and all made in the vicinity of Denver. But the dirt is not the common dirt mentioned above. It is a better grade of clay, found in such large quantities in the foothills to the west of Denver. Asking for information as to where all these clay deposits were found, my friend, Paul Brown, said, "Golden."

A visit of a clayworker to Colorado would not be complete without seeing Golden, which is situated some thirteen miles due west of Denver, just at the foothills of the Rocky mountains. To see the clay deposits there and the way they are operated is certainly a great sight. Clays are mined perpendicularly with solid sandstone ledges which stand 300 feet up in the air. Also, great mines where the well-known "Denver fire clay" is mined. It is all very interesting. They call these deposits "hogbacks." It is geologically a fine illustration of how the actual rock formations pushed the overlying clay beds up until they had a 90-degree angle. We were told that under the city of Denver proper the same clays are found at a depth of 1,500 feet and more. Among the clays found at Golden are fire clays, stoneware clays, plastic buff burning clays, also red burning and sewer pipe clays. There is also a vein of white burning clay, which was used some years ago by the Geijsbeek Bros. to make white table pottery.

Among the largest firms operating in Denver is the Denver Sewer Pipe and Clay Company. Mr. C. Geddis, the genial manager, gave us a great deal of information about the clay business in general around Denver. Their building brick department handles a great variety of colors, which are in great demand among builders and architects. They make a high-grade fire brick, which is shipped all over and outside the State.

The Denver Pressed Brick Company is the largest clayworking establishment making exclusively building brick. Here we met our old friend, Mr. R. D. Lindsay. Most of their brick are burned in up-draft kilns. It takes a long time to watersmoke, but they burn a good, hard face brick. They make a white brick and have also made some glazed brick.

In connection with this plant, but under separate management, is the Colorado Crucible Company, which is making a high-grade line of assayers' supplies and furnaces.

Mr. F. E. Marshall, of the Marshall Brick Company, spent considerable time with us, showing us his product and his plant. We were quite impressed with the up-to-date outlay he has and the uniform color of red pressed brick which he manufactures. On the burning question Mr. Marshall is evidently an expert, and has some ideas of his own regarding a combination up and down-draft kiln, which, properly developed, should be a fuel saver.

Most of the common brick plants are east of town, and we are told they move periodically, as the vicinity is built up, farther east towards the Kansas state line.

There is one plant in Denver of which we predict great things, for there ought to be a great demand for its products, and that is the Heinz Roofing Tile Company, of which Mr. G. P. Heinz is the president. We were attracted by his roofing tile, which were being placed on a gasoline filling station, and we consider the product first-class. In inspecting his plant we found that although still on a small scale, he is certainly able to produce excellent results. All kinds of shaped tile are made, and the color is a fine red, burnt good and hard.

Before we leave the Denver plants we wish to mention the Denver Fire Clay Company, which is so well known as making assayer supplies, and also the Western Pottery Manufacturing Company, which is making stoneware pottery. We had no time to visit these plants. There is also a terra cotta works near Denver, but we were unable to get permission to see the plant.

While at Golden we took occasion to follow Mr. Brown's advice and see the Golden Fire Clay Company, of which concern he is secretary. We found Mr. James Knox, president, at the plant, and he explained the whole method of process and also the various products they manufacture. Their fire brick are being shipped nearly from coast to coast, and they have a great demand for them from every industry. All brick are burnt in down-draft kilns at a temperature of about cone 12, and sometimes higher.

There is one thing which made us wonder while looking over these Denver plants, and that is that as far as the hollow tile game is concerned our far Western and Utah clayworkers are far ahead of our Colorado friends. The hollow tile has not reached those stages in its use there that it has in other Western cities. We asked some questions, had some arguments, and the idea was that the hollow tile was not suitable for this dry Colorado climate and its heavy, cold winter weather. Now, personally, we disagree with this, and we are of the opinion that before long Colorado will use exclusively hollow tile in preference to brick, for backing up especially.

SIWASH.

GET GOVERNMENT ASSISTANCE.

Our federal government has become much more paternal than it used to be. We not only have the Federal Trade Commission assisting business men to find their way to profits, but we have in the Department of Labor the United States Employment Service, which is absolutely free and may be developed into something of material value to the industries as well as to people seeking employment.

This Federal Employment Service has a lot of possibilities to it. If properly developed, it should not only put an end to fake employment bureaus and render much assistance to men who need jobs, but it should be able to serve many of the industries which need help, not only quantities of help to perform common labor, but also skilled help.

To sum the matter up short, we have government assistance in this matter of solving the help problem if we but seek it and keep in touch. You can get in touch with the employment service through almost any postoffice, because the Postoffice Department has been made depository, where blanks and information can be obtained both by those seeking work and those seeking for help. Why not, then, when you need things of this kind, let the government assist you to get in touch with the nearest local office of this bureau, make your wants known and see what they can do?

Reduced
Railroad
Rates
Granted by
The Trunk Line
and Central Traffic
Association.

Hotel
McAlpin
Convention
Headquarters.
Broadway
at Thirty-fourth St.
March 5-10, 1917.

OFFICIAL ANNOUNCEMENT.

Thirty-first Annual Convention of the National Brick Manufacturers' Association and Allied Organizations to be Held at Hotel McAlpin, New York, March 5-10, 1917.

AFTER THIRTY YEARS of meandering among the cities of the nation, it has at last been decided to accept the insistent invitation of Father Knickerbocker and hold the thirty-first annual convention of the National Brick Manufacturers' Association in New York City, now the largest city in the world. It is fitting that the oldest and largest association of clayworkers in the world should meet in the world's greatest metropolis, which awaits with glad hands outstretched to bid a hearty welcome to the makers of the one indestructible building material of which the city everlasting has been builded.

Reduced Railroad Rates.

The Trunk Line Association has granted reduced railroad rates on the certificate plan on the basis of 2 cents a mile for the round trip for delegates to the national convention and those who accompany them. It is anticipated that other traffic associations will concur and that a special rate will prevail from all points. Tickets will be good going March 3, 4 and 5. Full one way fare must be paid going and certificate taken for same. This, when vised by the secretary and the representative of the Trunk Line Association, will entitle the purchaser to a return trip ticket at the reduced rate. Certificates must be vised during the convention, but the return trip can be made any time prior to March 14.

McAlpin Hotel, Headquarters.

The convention will be held the week of March 5 to 10, 1917, in the famous McAlpin Hotel, which will afford unsurpassed facilities, being the largest hotel in the world, and this, too, is meet and proper, for it is predicted that the attendance at the convention will be the largest in the history of the association. The attractions of New York and its environs, its drives and parks, its statues and museums, art galleries and public institutions, its churches and cathedrals, its unequalled harbor and its several great suspension bridges, its tubes, subways and elevated railway, its great terminal stations, the largest in the world, and its many varied places of amusement, appeal irresistibly to every one.

For these reasons, New York is becoming the greatest convention city in the world. Mr. J. R. Young, secretary of the Convention Division of the Merchants' Association of New York, is authority for the statement that organizations of all kinds are more largely attended in New York City than anywhere else.

Hotel Rates.

The following rates will prevail at Hotel McAlpin during the convention:

Single rooms with running water (baths on every floor, without extra charge): $2.50 and $3.00 per day.

Single rooms with private bath: $3.00, $3.50, $4.00, $5.00, $6.00 and $7.00 per day.

Double rooms with running water (baths on every floor, without extra charge): $3.50 and $4.00 per day per guest; $4.50 and $5.00 per day for two guests; $1.00 per day is added for each additional guest.

Double rooms with private bath (one double bed): $4.00 $4.50, $5.00 $5.50, $6.00 and $7.00 per day. (Two single beds): $5.00 to $7.00.

Parlor, bedroom and bath (either for one or two occupants): $6.00, $7.00, $8.00, $10.00 and $12.00 per day.

The Hotel McAlpin is operated on what is known as the

New York and
The Hotel McAlpin

European plan, with the modification that, besides its regular a la carte service, special "fixed price" meals are served: Breakfast at 50 cents and 65 cents, luncheon at 75 cents, and dinner at $1.50. This unique arrangement enables guests who prefer to limit their expenditures to a stated amount per day, to do so, with the added advantage that they are not obligated to pay for any meals they may decide to have elsewhere. In other words, this innovation possesses the merits of the old American plan with none of its disadvantages.

Delegates will find it advantageous to occupy rooms jointly, single beds being provided where so desired, as a much lower rate is obtained that way and a much larger number can be accommodated. The latter is an important feature, for it is anticipated that there will be a record-breaking attendance. Early reservations will prove advantageous. In requesting same, delegates should state time of intended arrival, character of accommodations desired, number in party, etc.

The Complete Home Show.

An unusual attraction convention week will be the Second American Complete Building Show, which will be held in the Grand Central Palace, which affords unequalled facilities for such exhibits. The show will be given under the direction of those who so successfully conducted the first show in Cleveland last winter. The co-operation of the brickmakers of the country is particularly desired, with a view of making the show of utmost value to the building brick industry.

All Allied Associations Will Meet There.

As in former years, the American Ceramic Society, the National Paving Brick Manufacturers' Association, the National Clay Machinery Association, the National Building Brick Bureau, and other allied associations will meet in New York at the same time, and will be afforded unsurpassed facilities for their deliberative sessions and other functions.

The clayworkers of New York and vicinity are heartily in accord with the convention idea, and promise to leave nothing undone to make the meeting most memorable. A program befitting the occasion will be arranged. Members desiring any particular feature of the business discussed at any of the sessions are requested to communicate with the Secretary in regard to same. Those desiring information as to requisite of membership, etc., will please write to the Secretary at Indianapolis, Ind.

THE EXECUTIVE COMMITTEE,
Charles J. Deckman, President.
Theo A. Randall, Secretary.

CONVENTION DATES.

The New Jersey's Clayworkers Association. Rutger's College, New Brunswick, Dec. 27 and 28. George H. Brown, Director Ceramic Dept.

Illinois Clay Manufacturers' Association. Beardsley Hotel, Champaign, Jan. 15, 16 and 18. A. E. Huckins, Secretary, Urbana.

Iowa Clay Products Manufacturers' Association, Iowa State College, Week of Jan. 15. Prof. Homer F. Staley, Secretary, Ames.

Nebraska Brick & Tile Association, Agricultural College, Lincoln, Jan. 16, 17 and 18. Frank I. Ringer, Secretary, Lincoln.

Canadian National Clay Products Association, Royal Connaught Hotel, Hamilton, Ont., Jan. 23, 24 and 25. Gordon C. Keith, Secretary, Toronto, Ontario.

Wisconsin Clay Manufacturers' Association, Republican House, Milwaukee, Wis., Feb. 1 and 2. S. Weidman, Secretary, Madison.

The American Ceramic Society, Hotel Astor, New York City, March 5, 6 and 7. Edward Orton, Secretary, Columbus.

National Paving Brick Manufacturers' Association, McAlpin Hotel, New York City, March 5 and 6. Will P. Blair, Secretary, Cleveland.

National Brick Manufacturers Association, McAlpin Hotel, New York City, March 7, 8 and 10. Theo. A. Randall, Secretary, Indianapolis.

National Clay Machinery Manufacturers Association, McAlpin Hotel, March 8.

IOWA CLAYWORKERS ASSOCIATION TO BE HELD AT AMES, IOWA, EARLY IN JANUARY.

The Ceramic Engineering Department of the Iowa State College has plans well under way for an elaborate Clayworkers' Institute, to be held the week of January 15, 1917. The Institute will comprise both laboratory work and lectures by speakers of national reputation, who will deal with the various phases of clay products manufacture, efficient methods, freight rates and regulations, marketing and advertising. A number of men recognized as experts in their particular lines have already been secured as speakers. Among these may be mentioned Lawrence E. Baringer, of Schenectady, N. Y., president of the American Ceramic Society; Professor A. B. Bleininger, of the Bureau of Standards, Pittsburgh, Pa., and Professor A. E. Williams, also of the Bureau of Standards, Pittsburgh. Other speakers will be announced in the near future. Additional equipment is now being installed in the ceramic laboratories in order that large groups of men may be handled to the best advantage in the laboratory work to be held during institute week.

Among other special attractions will be a free six-reel movie, illustrating the manufacture of clay products in various parts of the world, and a special called meeting of the Permanent Buildings Society.

In connection with the institute there will be held the annual convention of the Iowa Clay Products Manufacturers' Association.

PROSPEROUS DAYS FOR E. M. FREESE & CO.

During a recent visit with E. M. Freese & Co., at Galion, Ohio, we were pleased to note that their factory was running full handed, and that a feeling of optimism pervaded the whole office. This company has had a splendid year's business. Among the long list of plants furnished are those of the Streator Clay Mfg. Co., Streator, Ill., with Union combined machine, cutter, disc feeder and pugmill; The Westfield (Mass.) Clay Products Co., with a complete equipment consisting of a Union machine, rotating cutter, crusher, disintegrator, disc feeder and winding drum, etc.; Kittanning Buff & Grey Brick Co., Bridgeburg, Pa., complete outfit, including Union machine, rotating cutter, pug mill, conveyors, elevating machinery, line shaft, pulleys, etc.; and the Charles Taylor Sons Co., Cincinnati, Ohio, auger machine, pug mill and cutter.

JUST THE SAME.

As usual, the Book of Smiles for December averages several smiles to each page. One of the best "hits" is a poem on the result of the recent election. We reproduce the first verse. Those wanting the balance of the lyric and the many other clever skits can obtain same by addressing Standard Dry Kiln Co., Indianapolis, Ind. See ad on page 520.

Though Wilson is elected there's no call to get the blues,
For the smoke goes up the chimney just the same;
Nor should we fret or worry, if the job had gone to Hughes,
For the smoke goes up the chimney just the same.
Your Uncle Sam has prospered for a hundred years and more,
Through trials, tribulations and discouragements galore;
We've had financial panics and we've had a taste of war,
But the smoke goes up the chimney just the same.

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THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Date Set for Convention of Wisconsin Clayworkers.

Editor The Clay-Worker:

The seventeenth annual convention of the Wisconsin Clay Manufacturers' Association will be held in Milwaukee, February 1 and 2. Headquarters will be at the Republican House.

A program of interest will be presented, and it is hoped that a large number of the brick and tile manufacturers of the state will be in attendance.

Yours very truly,
S. WEIDMAN,
Secretary Wisconsin Clay Association.

Ceramic Engineer Passes Away.

Editor The Clay-Worker:

It is with regret that we inform you of the death of Mr. L. B. Coulter, which occurred at his late residence in this city on October 26, after an illness of three months. He was a native of Ohio, having been born in that state thirty-eight years ago. After his graduation from Ohio State University he was for a time associated with Professor Edw. Orton, Jr., in the manufacture of pyrometric cones. For the past eight years he had held the position of chief ceramic engineer for this company. He was an active member of the American Ceramic Society, having contributed several valuable papers at their meetings. He was also a member of the American Chemical Society and the American Society for the advancement of Science. Locally he was a member of the Masonic Lodge.

Yours very truly,
S. C. LINBARGER,
Niagara Falls, N. Y. The Carborundum Co.

New Jersey Association to Meet in December.

Editor The Clay-Worker:

The winter meeting of the New Jersey Clayworkers' Association will be held on December 27 and 28, at Rutgers College, New Brunswick, N. J., and an interesting and instructive program, including papers treating of the practical as well as of the technical problems of the ceramic industries has been prepared. The members of the association are urged to attend, and all others interested in the furtherance of the welfare of the ceramic industry in this country will be cordially welcomed at the meetings of the association.

The investigation work on the clays of New Jersey being conducted by the ceramic department at Rutgers College is being continued through the present school year. To date complete tests having been made on about 200 representative clay samples.

Very truly yours,
G. H. BROWN,
Director of Department of Ceramics,
New Brunswick, N. J. Rutgers College.

New England Jottings.

Editor The Clay-Worker:

The brickmakers of Connecticut generally have had a very good business the past year. Those in Berlin and vicinity are getting ready for a prosperous season in the season of 1917, and to that end are installing labor-saving machinery and equipment. The Donnelly Brick Company, of Berlin, is making 50,000 brick per day with nineteen men. Can any one beat that for an up-to-date plant? This company has just installed a Wellington Machine Company's steam rack dryer.

The Tuttle Brick Company, of Middletown, Conn., is installing two steam dryers which will enable them to operate right through the year.

Murray Brothers, of Clayton, also installed an up-to-date dryer the past season.

The brick yard of A. C. & F. G. Burnham, at Montague City, Mass., has been sold to Frank E. Fuller, of Springfield. This plant has not been operated for two years, and Mr. Fuller has not yet decided whether he will operate the plant or dismantle it.

The Wilson Brick Company, of Hartford, Conn., suffered a $15,000 loss recently when a large building used as a tenement for the families of workmen was burned to the ground, December 11.

F. Musso, an employe of the Stiles Brick Company, fell from the roof of a freight car which was being shifted from the main line to the brickyard siding, and rolled under the wheel of the car and was killed instantly.

NUTMEG.

ALL HAIL! THE N. B. M. A.

Dear Mr. Editor of The Clay-Worker:

At last Father Knickerbocker is going for the first time to have the felicity of opening his friendly arms with a joyful welcome to the human bricks that form the National Association, and I prophesy that it will be a crowning event, and in the outcome the premier of all the splendid conventions that have gone before.

Here the boys are coming to the imperial city of the U. S. A., the city of joy, and money, and power, the city that is moving the greater part of the world with her vast resources, the city famed above all for her multiplicity of brick and in its beauty of form and embellishment in buildings, which, if equaled by any, is surpassed by none.

Our city will prove to be a Mecca to any of the members whose nature is attuned to brick. The examples of artistic brick as found in our buildings will be an inspiring revelation and a promoter of art in burned clay for those who view the set product. Then here will be found the highest buildings in the world—the skyscraper par excellence made ornate with terra cotta of various shades.

For sight-seeing and entertainment the field is unlimited—our noble Public Library building; the Museum of Natural History, containing thousands of unique and interesting marvels; Metropolitan Museum of Art; the Stock Exchange and the Board of Trade; the noble Hudson river, the greatest artery of brick in the world; the theaters, almost without limit for number, where the very highest art of the stage in spoken plays and superb movies can be enjoyed; cabarets for those who love to view dancing at its best, and skating rinks, where championship contests can be witnessed. Added to all this are famous department stores, then great factories carrying on extensive industries, great hotels—the greatest on earth, are an interesting spectacle.

The world-famous Fifth avenue, well worth a stroll and observation tour; then a visit to Grant's tomb; a view of the Pallisades from the Riverside Drive at the tomb. The field for pleasure here is almost boundless, and things to interest newcomers and visitors are almost without limit; but brick is the real thing, and New Yorkers should be treated to a grand and special display of unique and practical combinations of it as a modern structural art product, based on the genius of the manufacturers and their allies, the architects.

We have waited all too many years for an N. B. M. A. convention to be held in Little Old New York, and with it an exhibition of brick composed into various forms of structure, both practical and ornate. It would capture the public here. Brickmaking machines are an unsolved mystery to the bulk of mankind here, and if not the machines on exhibition, working models of them would capture the interest of visitors to the display.

Hail the coming convention with enthusiasm. The members will find that Father Knickerbocker has his latch-string outside of his door and a tag on it labeled "Build With Brick."

Faithfully yours,

New York, Nov. 24, 1916. DANIEL E. RYAN.

THERMAL EFFICIENCY IN THE DOWN DRAFT KILN.

By Wm. A. Butler.

IN THE CONTINUOUS kiln the surplus heat, if any, will be found in the wake of the fire, or in that portion of the kiln immediately back of the full heat section. In the down draft kiln, while it is in operation, the waste heat, of which there is an over-surplus, will be found in the outgoing gases in front of the fire or, properly speaking, in kiln bottom, draft flue and stack. The fact that the combustion air moving as it does through a mass of already burned incandescent brick in the continuous kiln is the greatest factor in its thermal efficiency is proven both in practice as well as in theory. And anyone familiar with the operation of a continuous kiln of the Hoffman type knows that if we were to suddenly cut off the heat following the full fire and allow cold air (ordinary atmosphere) to take its place, the results would be so disastrous that not only would there be damaged brick, but the fires would actually die out.

Therefore, the greatest economy of the continuous kiln lies in the heating of the combustion air to a high degree, which process, in other kilns or systems of firing, would be called preheating the air of combustion. As to the economy in front of the fire, the spent gases of combustion are reduced to sultry vapors, incapable of supporting combustion, and as it is natural for gases to condense in passing through cold, green brick, these vapors must be drawn off by means of the draft flue.

All of the firing shafts from the burned brick to the first faint glow receive their impetus and momentum from the convection of heat by the forward movement of the combustion air from the discharging part of the kiln, or that portion where the kiln is open to the atmosphere. So that it would not be inconsistent to say that 90 per cent. of the economy of the continuous kiln lies in heating the combustion air and 10 per cent. in watersmoking. When this point comes home to us, and is clearly fixed in our minds, it is easy to see where the great wastefulness takes place in the down-draft kiln as ordinarily fired.

From the start to the finish of the burning period in the down-draft kiln we are continually heating air from the atmosphere to combustion temperature, which, in the continuous kiln, is already done for us, as previously stated. And, knowing the "how" and "why" of kilns in general, and waste heat in particular, "it must follow as the night the day" that, applying the principle of heating the combustion air by means of waste heat in the down-draft kiln, we will obtain increased thermal results according to the efficiency of our system.

For sometime I have been much interested in what I call a recuperative down-draft kiln. The heat from the combustion of fuel passes through the burning ware, then through and around the spaces in which the combustion air passes to the furnaces, the outgoing gases preheating the incoming air for combustion by radiation, the said combustion air being muffled from the outgoing gases by refractory materials.

It is well known that air at a high temperature has more affinity for fuel than air at atmospheric temperature, and that the hotter the air of combustion, the more immediate will be the ignition.

The incoming air from the air flue passes into the vertical central flue, which is concentrically surrounded by the draft flue, the air flue opening into the upper space in the kiln bottom, the draft flue drawing from the lower space.

The upper and lower spaces and the draft and air flues are separated from each other, so that the outgoing gases cannot contaminate the incoming air, and the incoming air can in no way interfere with the draft. The incoming air is highly heated by radiation from the outgoing gases, and it is obvious that the hotter the fire maintained in the kiln, the more intense will become the heat of the air of combustion.

DEMURRAGE RATE INCREASED.

One of the direct results of the Interstate Commerce Commission inquiry into the distressing car shortage of the early winter was a rule for an increase on demurrage to be maintained until next May.

The new demurrage rate is a sort of compromise between what the railroads ask for and what the shippers request. Under the new scale there will be two free days, following which there will be $1 charged for the third, $2 for the fourth day, $3 for the fifth, and $5 for each day after. The rule that charges shall be suspended on cars when the weather prevents unloading and the so-called "average agreement," by which credit is allowed shippers who unload in less than two free days, are retained.

While there is some excuse for this, which excuse comes out of the holding of cars for warehouse purposes at seaboard points and some holding the cars in transit for reconsignment, it is really another case of the railroads making the people help bear the burden when they get into trouble. This is especially true in the matter of the brick trade, because there is very little transit selling or storage of cars of brick and clay products.

The truth of the matter is, most of the difficulty was caused by railroads in part of the country holding cars belonging to other roads, for which they only had to pay 45 cents a day. There is a proposition to make the railroads pay a little more, too, but no provision has ever been made for the railroads to pay each other as much for cars held as the public is made to pay, and there was manifested throughout the hearing a disposition on the part of the roads to blame the shippers for most of their trouble or try to put the burden upon the public. Somehow we would feel better toward the railroads and would be more inclined to ask the public to accept cheerfully this temporary increase, if the railroads themselves would act in better spirit and acknowledge their own shortcomings and strive to correct them, instead of wanting to put the blame and the burden upon the public. It doesn't show the right spirit of co-operation, and we believe the railroads could have solved their own shortage problem without making any changes in the demurrage rules.

TRADE WANTS.

Charles C. Glidden, of Birmingham, Ala., would like to correspond with manufacturers of shale planers.

Parties looking for a desirable site in the east for either a paving brick or building brick plant, or a combination of the two, will do well to get in correspondence with M. H. Whiteman Krewson, Philadelphia, who has a very fine deposit of clays adapted to the manufacture of both building and paving brick.

E. M. Weinfurtner, treasurer of the Ashland Fire Brick Co., Ashland, Ky., writes that his company will build a new office building and they would accordingly be very glad to receive plans and suggestions for the construction of such a building along latest lines and equipment.

The Toledo Vitrified Brick Co., Toledo, Ohio, advise us, through the manager, A. H. Zimmerman, that they will put in a dry press machine shortly after the first of the year, and would like to hear from manufacturers of dry press machines.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVI. DECEMBER, 1916. No. 6.

CURRENT COMMENT.

Merry Christmas.

* * *

Write "Build With Brick" at the top of that "new leaf."

* * *

The face brick folks are to be found in front in the matter of boosting the brick-building game.

* * *

Lowering the cost of living is quite a favorite pastime these days—in theory and in the newspapers at least.

* * *

Get the price you should for your product and you can get help at the bank when you need it, but you won't need it so often.

* * *

Old King Coal has been cutting a few capers this winter that may make the miners merry, but it makes the paying public groan.

* * *

Greater New York is a great place any time, these days, but the bright days in the brick calendar for the Great White Way are those of March 5-10.

* * *

That brutal turmoil in Europe is proving a veritable juggernaut for the smaller nations in its path, regardless of whether they take sides or not.

* * *

Brick is not only the greatest building material in the history of the past, but it has a chance to be a bigger thing in the future than ever before, with a fair measure of assistance in the way of educational exploitation.

* * *

The drain tile season seems to be winter time and spring, but it ought to be all the year around, and somehow we think it can be made so by enough persistent educational work. Anyway it is easy to see that the drain tile business can be materially enlarged and that the farmer sentiment is now ripe for pushing this business.

* * *

The annual coal pile of the country is a pretty big thing, running to a total in round figures of 600,000,000 tons, or an average of 2,000,000 tons for every working day. Are you getting yours?

* * *

If you have in mind some subject matter that you think ought to be made a feature of the annual N. B. M. A. meeting, write the secretary about it. See official announcement on page 554.

* * *

There ought to be such a thing as "color" in architectural outlines as well as in face brick, and also room for a study in harmony of lines and colors.

* * *

Some idea of the possibilities of the income tax is furnished by the fact that during 1916 the receipts from individual incomes aggregated $64,943,594.63, while the corporation income tax amounted to $56,993,675.98.

* * *

From California, from whence came the bungalow and the recent re-election of President Wilson, we are now hearing something about a new fad in architecture—"the Canary cottage." Who can tell us just what it is?

* * *

The awarding of $65,000,000 worth of contracts by the Secretary of the Navy ought to furnish some work to tide through the period till a new navy bill can be put through for the spending of $400,000,000—and here's hoping they don't work too many pork barrels into it.

* * *

Make the first date for the new year a date to meet the other fellows on Broadway in little old New York, March 5-10, because centering around and spreading out from the great McAlpin Hotel there are going to be great doings for the brick folks among the bright lights of the White Way.

* * *

A preliminary report of the Bureau of the Census indicates that the total population of the United States is 102,826,309, and when to this is added the population of Alaska, Guam, Hawaii, Panama Canal zone, Philippine Islands, Porto Rico and Samoi, our non-contiguous territory, the total comes up to 113,309,285. The big part of this non-contiguous population is from the Philippine Islands, where we have nearly 9,000,000, or more people than are to be found in any State in the Union except New York.

LIVE AND HELP LIVE—A YULETIDE SERMON.

"Peace on Earth and Good Will to Mankind." This familiar sentence, in its variations, when fully comprehended, embraces more of a genuinely religious doctrine than is often combined otherwise in so few simple words. In substance it antedates Christianity, and in scope it covers many religions and embraces practically all creeds of civilization; it inspires mankind to higher ideals, broader conception and bigger deeds; it leads to stock-taking, both materially and spiritually, to the making of new resolutions, the laying of fresh plans and to doing better things in a better way.

It is in keeping with this spirt that we are going to propose a new slogan, as a worth-while idea for the new year and a fit companion for the already popular "BUILD WITH BRICK." The new offering is "LIVE AND HELP LIVE."

The truly co-operative idea in mankind involves something more active than mere letting people alone to carve out their own way; it means to help. It is a revival of a spirit that was born before the days of Christianity. Back in the old north countries, where the Yuletide celebration was originated, there was an annual manifestation of faith that the powers that be would send the sun again to warm the earth and make it produce, and the form of this manifestation consisted in gathering for great feasts and in comparing notes one with the other, as well as exchanging friendly greetings. Then those who found themselves more fortunate than others proceeded to divide and in this way to help the others live through the season till the earth produced again. Here we can easily find the point of distinction between the old saying of live and let live and the modified offering presented herewith of live and help live. The one suggests passiveness and lack of attention, while the other presumes a form of active co-operation which makes for the welfare of all concerned. This is the spirit we want to see developed in the trade during the new year, not merely for the Christmas season. The same thought prevails here that was set forth in the Thanksgiving brief of last month, that we should not confine ourselves to a brief period of this kind of right thinking and acting, but extend it throughout the year.

THE MODERN SPIRIT OF CO-OPERATION.

There is a noticeable disposition being manifested throughout the country toward the kind of co-operation which means live and help live. We find it as between business men in the same line of industry, and also as between employer and employe. One of the features of the past year has been a general turning to the idea of profit sharing in industries, and as the year comes to a close we find announcement after announcement of concerns that have taken up with this idea in one form or another. There goes along with it the question of housing, of schools, of encouraging thrift among employes, and a number of similar issues, which illustrate the tendency to help one another, the presence of a spirit which may well be crystallized into a general cry of live and help live.

In the official publications of the manufacturing industries we see quite a lot of expressed sentiment along this line, including a study of what is termed the new relations of master and man, in which it is said that the industrial strife, the destructive struggle between labor and capital, is a problem of the centuries which seems to defy solution. Yet we are actively solving this same problem right now.

What we are working for and what is meant by this proposed new slogan is a co-operative spirit all the way along, including co-operation between heads of industries in a given line of endeavor, co-operation between different industries themselves, and co-operation between heads of industries and the men who do the work, to the end that all may benefit—that is, all may live better.

THE NEED FOR BETTER PRICES.

It naturally follows that if all are to live better—that is, if the employer or owner is to get more and keep his business on a firmer basis, and at the same time pay more to his help, so that they may live better lives, he must obtain more for his product, and this leads us to the crux of the matter—to one potent reason why the newly proposed slogan of LIVE AND HELP LIVE is a fit comparison for BUILD WITH BRICK, that other slogan which The Clay-Worker has labored industriously for some time to popularize. One of the ideas is to boost the use of brick so that there will be more of it demanded, and the other is that of co-operation to get a better price for brick, to the end that brick manufacturers may live better and may help their employes to live better. The first thing, therefore, is for brick manufacturers to help each other live—that is, for each man to make up his mind he is going to stand out for a price that will make him the right kind of a living; that he is going to help the other fellow get a price that will make the right kind of a living. Then from this helping of each other in this way to realize the right price, it is easy and simple enough to turn about and make use of the same spirit in the dealings with employes.

In short, we take it that the one big idea for the new year can well be embodied in this slogan. The spirit is already with us, the spirit of co-operation, of upbuilding, the desire to live a bigger and a fuller life, and to have the country as a whole set an example to the world; and somehow we have a feeling that the rallying cry around which the spirit may well center is contained in the headline of the present effort at a Yuletide sermon, to **live and help live.**

THE BUILDING OUTLOOK.

Any man can make almost any kind of a guess he has a mind to about the possibility of building operations during the new year and find some followers or believers. In this day of rapid changes it is impossible to forecast with any degree of certainty what may happen a few months hence.

The one thing we have positive evidence of is that this great country of ours is rolling in wealth. We not only have more money in this country than was ever here before, but the country as a whole has become the financial center of the world and possesses more of the gold supply, perhaps, than all the rest of the world combined, and certainly more than any one country.

It is difficult to get at the division of this wealth. The wage earner claims his goes for the high cost of living and the same thing is heard from the manufacturer, while the farmer evidently is reaping a harvest of profits never dreamed of in days gone by. Meantime, however, there are many mushroom millionaires, to use a figure of speech, who have obtained wealth either directly or indirectly through war orders and the so-called war babies.

We know of nothing better that could be done with this increase of wealth in our country than to invest it in the building of new homes and better homes and the establishing of industrial institutions, the building of public buildings, warehouses, etc. Logically this should be the thing to happen. The coming year should be the biggest year in the history of our country in the building industry. How it may be handicapped by high prices of steel, labor troubles and things of that kind is something no man can foretell. We can only argue that if things "break right" the coming year should logically be a big one in building operations. The clayworking industry should set itself to work and make preparation to turn it into the biggest year on record for building brick.

PRICE PUBLICITY.

An interesting suggestion made by a subscriber in the correspondence corner of The Clay-Worker for November was that the face brick manufacturers publish their prices from month to month in the columns of The Clay-Worker, so as to keep each other informed of what prices prevail for various offerings in face brick.

This is not only an interesting suggestion, but it is a reminder that about the only widely published prices we have in the clayworking industry are the average prices given in the annual report of the clayworking statistics compiled by the U. S. Geological Survey. The average prices, while they show the comparative level of price ranges from year to year, do not give enough definite information as to the price on any particular grade or kind of brick at any given locality. Moreover, these are not published until after the year has passed away, and they are of but little value so far as a guide to current prices is concerned.

There is occasional reference in the news correspondence from various centers of price quotations prevailing at the time in the trade, and it would perhaps make these letters more specifically valuable to the trade if a feature were made of quoting local prices. This is done in some other lines of industry right along—that is, a feature is made of quoting the current market prices.

In the matter of face brick, which have a price interest beyond the local field, general publicity of the prices on various standard face brick offerings should not only prove valuable by informing different members of the trade, but it should prove a useful guide to dealers and to makers of common brick who may desire to purchase for their trade various offerings in face brick. The Clay-Worker will be glad to have the opinions of others in the trade on this point, and also any specific suggestions that any one may desire to make to further the idea.

NET PROFITS.

In closing the books and striking the balance at the end of the year is when a man is in a position to get at his net profits for the year, and to revise his costs and other items in accounting so as to make reasonably sure of the right kind of profits for the ensuing year.

In the matter of net profits there has developed somehow, out of conferences with the Federal Trade Commission, the conclusion that 10 per cent. net should be the minimum strived for and that no man should be content with less. It is argued that a price for one's product which will result in a 10 per cent. net profit, even though that price is arrived at by conference and agreement with competitors, is neither exorbitant nor in restraint of trade under the Sherman Act.

There is some question hinges on just what constitutes 10 per cent. net. Those who are in the "know" are working upon the idea of including in cost deductions not only all the recognized items of cost, but also an interest on the capital invested that will make the equivalent of 6 per cent. a year, in addition to charges for depreciation, etc. Are you figuring this way? And, if so, does it leave you with the minimum of net profits you are entitled to under this line of reasoning?

In the work of closing the books at the end of the year and making your inventory and striking your general balance, it is well to consider these things seriously and come to some understanding, from this consideration, as to what prices it will be necessary to obtain for the product to realize the profit you are entitled to. Then the next step should be to get together with your competitors and plan to get the price.

WELL KNOWN SALESMAN ADDED TO J. D. FATE & CO. FORCE.

J. F. Chambers, well-known machinery salesman who will be remembered by the older clayworkers of Ohio and Indiana, has joined the sales forces of the J. D. Fate & Co., at Plymouth, Ohio.

TRANSACTIONS AMERICAN CERAMIC SOCIETY.

The eighteenth volume of the Transactions of the American Ceramic Society is being mailed to the members. It is a very substantial book of nearly 1,000 pages, ably edited and arranged by Arthur S. Watts. Price in cloth, $6.25. It is a little library on the ceramic art brought up to date. Those desiring copy of same or information in regards to contents of same, are requested to address the Secretary, Prof. Edward Orton, Columbus, Ohio.

FRED B. ADAMS JOINS THE ARMY OF FACE BRICK DEALERS.

The Adams Clay Products Company, Martinsville, Ind., announces the retirement from the firm of Mr. Fred B. Adams, who will in the future devote himself exclusively to the sale of front brick on a brokerage basis, with office and display rooms in Indianapolis. The Adams Clay Products Company will continue under the same management as heretofore, namely: C. C. Coleman, president and general manager; C. A. Pritchard, vice-president, and Carl Nutter, treasurer.

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THE STORK VISITS THE WREFORDS.

William B. Wreford, the Second, arrived at the home of "Billie" Wreford, the popular manager of the Detroit Brick Manufacturers' and Dealers' Association, early in December. Between his west side picture show and this new domestic responsibility, Billie's evenings out are now restricted to the unavoidable.

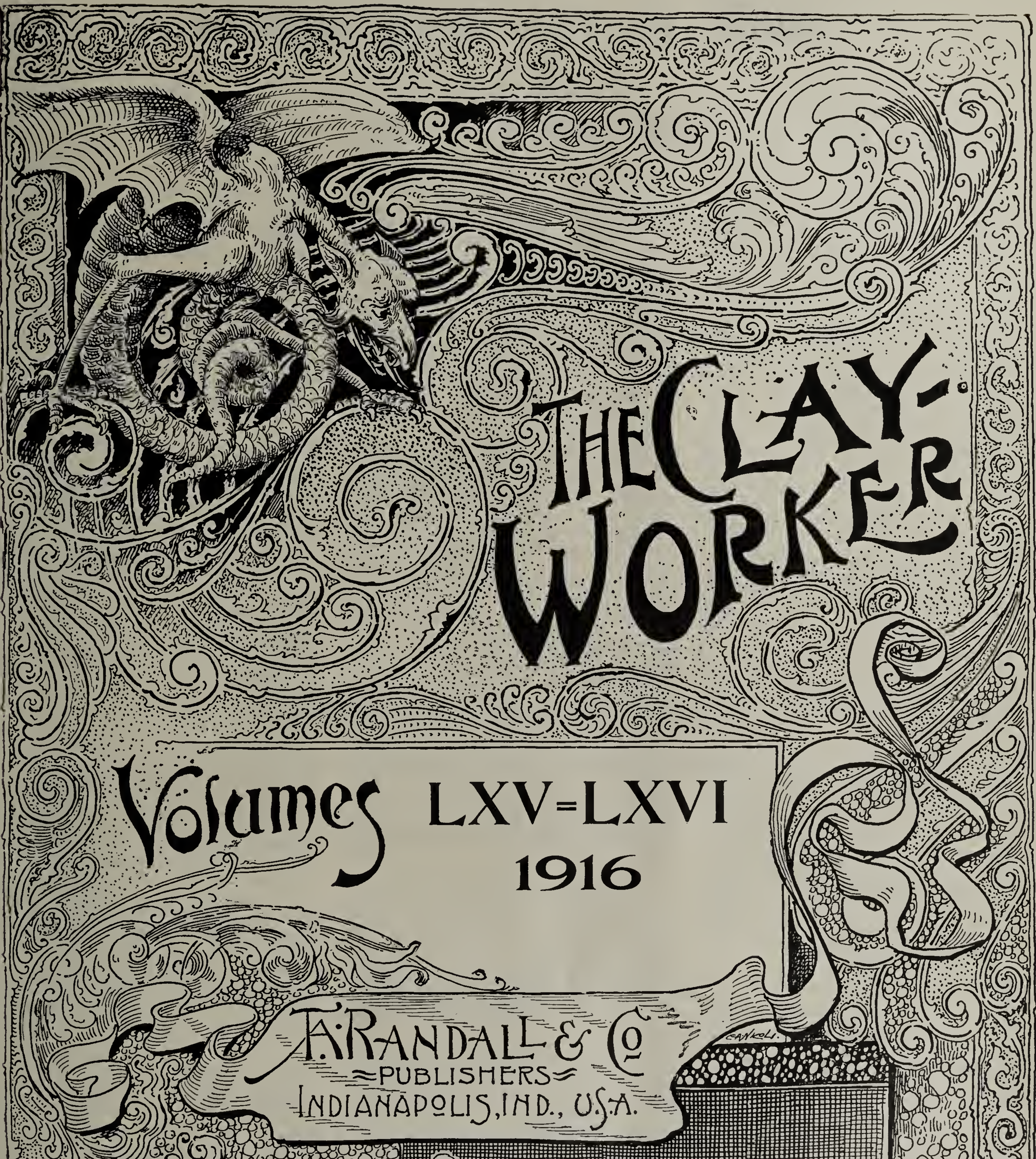
DISASTROUS FIRE AT GLENHEAD, N. Y.

The many friends of Jotham Post, East Williston, Long Island, N. Y., will regret to learn that his brick plant at Glenhead, N. Y., was recently destroyed by fire, the cause of which is unknown. The plant was entirely destroyed, entailing a loss of nearly $50,000, but partially covered by insurance.

SAYS THE EDITOR.

Oh, ye gods and little fishes—
And a tush and several pishes—
Darn the booster cuss that dishes
  Up the stuff that's always wrong!
It's our aim to be veracious,
To avoid the disputacious,
But now and then—good gracious,
  We are up against it strong!
It's the Truth we want to tell,
But there's times in which we've fell
For a booster (?) bound for—well,
  Down where liars sure belong.

—Exchange.



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HOEHNE TOP FIRED CONTINUOUS KILN
No Dampers

SMOKE ABATE—
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We design, construct and OPERATE

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We ask ourselves after the Holidays, "What about next year?" We invariably ask ourselves the question—"Where can we cut down our cost?" The two large items on our books are labor and fuel. The labor item may increase, it is certain it wont decrease, therefore the place to cut down expense is fuel.

With up-draft or down-draft kilns, the average coal consumption per 1,000 brick is 1,200 lbs of coal. In a Haigh Kiln the average is 480 lbs of coal.

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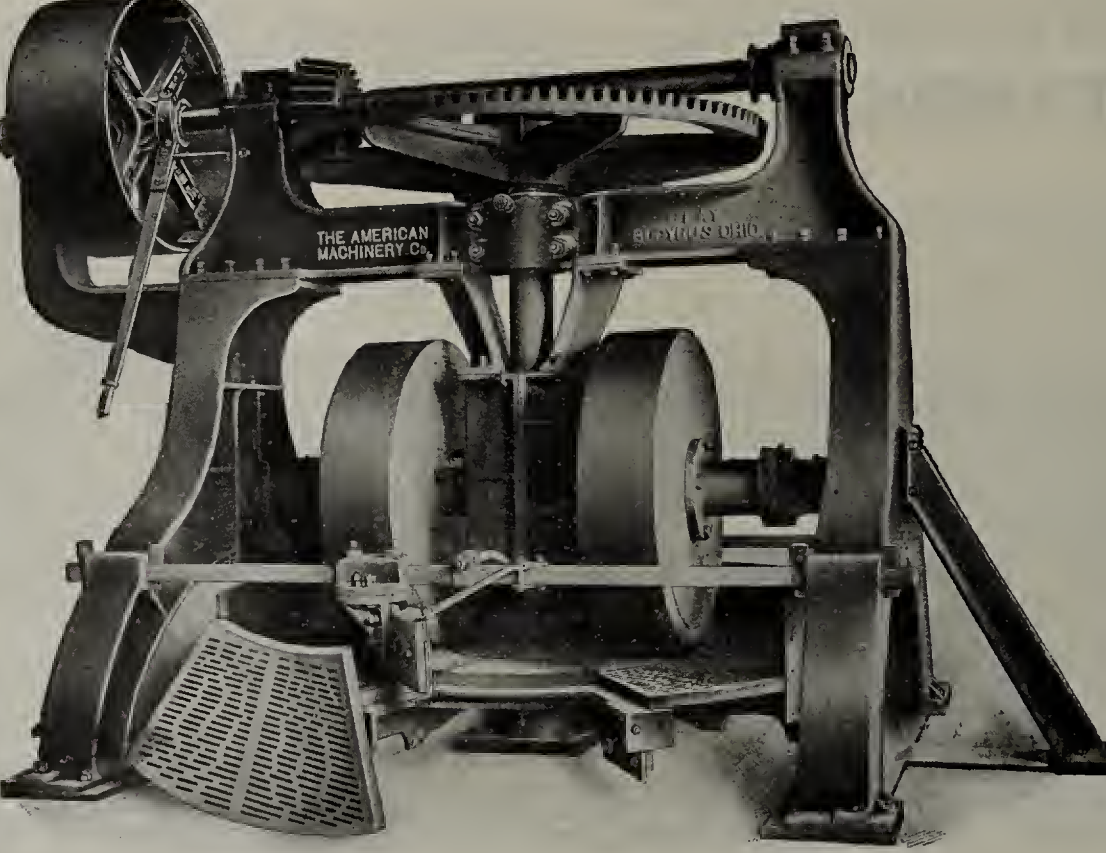
THE AMERICAN CLAY MACHINERY CO., Bucyrus, Ohio



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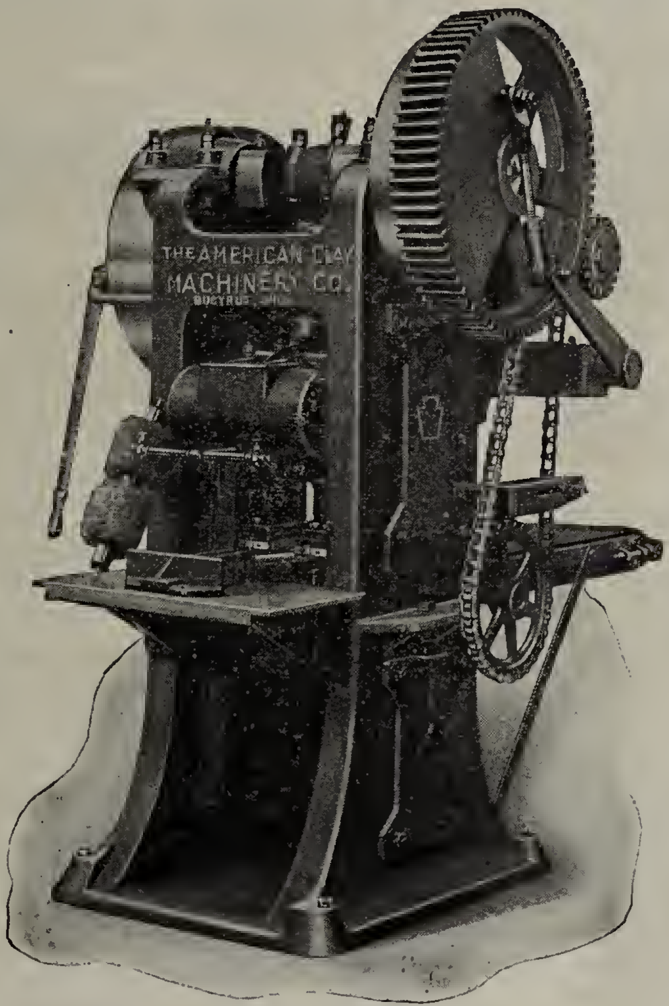

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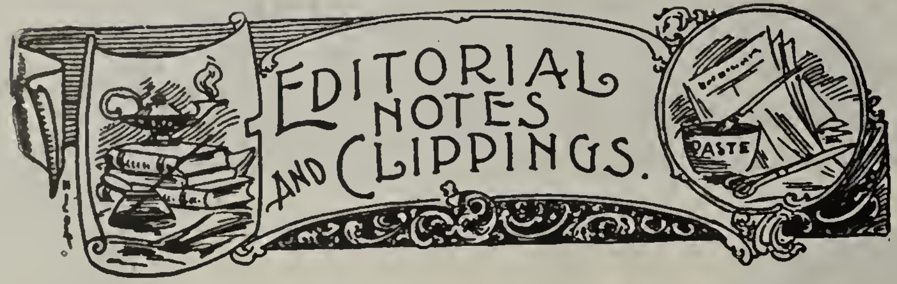

EDITORIAL NOTES AND CLIPPINGS.

Wm. J. Hempel, Sr., is to start a tile factory at Howard Lake, Minn.

C. J. Martin, of Miami, Fla., would like to receive prices on brick and tile for twelve six-room bungalows.

Extensive additions and improvements will be made to the plant of the Onondaga Pottery, at Syracuse, N. Y.

The Illinois Brick Company, of Chicago, Ill., has declared an extra dividend of 2 per cent., payable December 20.

E. H. Bradley, of Layton, Pa., has purchased a tract of land near that place, on which he will build a modern brick plant.

The plant of the Hammond Brick Company, of Hammond, La., was badly damaged by fire recently, which started in the drying tunnels.

The F. R. Carter Brick Works, of Peoria, Ill., is preparing to double its output of bricks and work its plant at its capacity of 40,000 bricks a day.

Powers Brothers, who recently bought the plant of the Abilene Press Brick Company, of Abilene, Tex., will install new machinery and appliances.

The big steam shovel at plant No. 3 of the Western Brick Company, Danville, Ill., was almost destroyed by fire recently, which started from sparks from the engine falling on the roof.

The Staunton Clay Products Company, of North Mountain, W. Va., of which C. H. Forry, of Newark, O., is manager, will erect a plant with a daily capacity of 100,000 face brick and 60,000 paving brick.

Z. Fowler has brought suit against the Washington Brick and Terra Cotta Company, Washington, D. C., for $25,000 damages alleged to have been sustained while he was employed for the company, when the walls of a brick kiln caved in on him.

The plant of the General Refractories Company, at Olive Hill, Ky., was destroyed by fire in November, causing a loss of about $100,000, on which there is an insurance of $50,000. About three hundred men were employed at the plant, which will be rebuilt at once.

John W. Cullen, the head of the Cullen Brick Company, Cleveland, O., died at his home in that city recently of heart trouble. Mr. Cullen was the son of Peter Cullen, who, it is said, was the first brick manufacturer in Cleveland. A widow and one daughter survive.

The Harbison-Walker Brick Company, of Pittsburg, one of the largest brick manufacturers in the world, with plants in various parts of the country, employing about 1,000 men, announced to the men, November 29, a general increase of wages, affecting all plants. Laboring men received an increase of 20 cents per day; molders 6 cents per 1,000, and other brickmakers and office men an increase in the same proportion.

The annual meeting of the Zumbrota (Minn.) Clay Manufacturing Company was held recently, and according to the report of Wm. Reimer, manager of the institution, one of the best fiscal years in its history was enjoyed. Twice as much business as in former years was transacted. Over 400 carloads of tile were shipped out, and at present there are a large number of orders waiting to be filled. The directors are: Edw. G. Hammer, Wm. Croxford, A. J. Rockne, R. P. Sigmond, John Starz, P. C. Kalass and John A. Johnson.

The Whitacre Fireproofing Company, of Waynesburg, O., and the Greer-Beatty Clay Company, of Magnolia, O., have joined forces and will hereafter be operated under the firm name of the Whitacre-Greer Fireproofing Company. J. J. Whitacre, who heads the Whitacre company, retains the senior partnership in the new organization, and other incorporators are: R. E. Whitacre, John B. Whitacre, of Canton, and R. E. Greer, W. H. Greer and S. E. Greer, of Magnolia. For the present the plants will be operated as in the past, but in the next few months plans will be completed for the enlargement of both concerns. Each industry turns out the same product, fireproofing materials and clay products.

The Ceramic Tile Company, of Chicago, has been incorporated by D. B. Boyden, W. E. Coulter and Clyde C. Colwell.

The Post City Brick and Tile Company, of Post, Tex., is in the market for machinery and equipment for a brick and tile plant of 40,000 daily capacity.

The McCormick Brick and Construction Company, of McCormick, S. C., has been incorporated by J. F. Wilson, J. J. Andrews, R. M. Fuller and J. E. Britt.

The Brazos Brick and Tile Company, of Rosenberg, Tex., will make a number of improvements and additions to the plant, including the building of two two-story drying sheds, of hollow building tile.

Thomas L. Barrett, of the Fireproofing Appliances Company, Louisville, Ky., is interested in an agency proposition from a good architectural terra cotta company for representation in that territory.

The Chicago Retort and Fire Brick Company, with plant at Ottawa, Ill., and headquarters in Chicago, Ill., recently closed negotiations for 480 acres of land containing exceptional fire clay deposits.

Rex Wilson, an employe of the Oskaloosa (Ia.) Vitrified Brick Plant, sustained a painful injury recently, when his arm was caught in a belt and he was carried around the pulley, breaking the bones in the elbow.

W. G. Lowry, president of the West Concord Brick and Tile Company, West Concord, Minn., announces that the plant will be run right through the winter and that in the early spring a number of improvements will be made.

The Sparta Brick and Tile Products Company, of Sparta, Mich., has been organized, with $40,000 capital stock, to manufacture both brick and drain tile. Those interested are A. H. Blanchard, of Grand Rapids; C. A. Johnson, of Sparta, and Frank Wheeler, of Toledo.

The Ohio Valley Brick Works, at Toronto, O., was totally destroyed by fire December 1, which is thought to have originated in the drying tunnels. The property belongs to the American Sewer Pipe Company and the loss is placed at $60,000. One hundred men were thrown out of employment.

J. B. Hammond & Co., of Bolivar, Pa., has purchased the old plant of the Fort Payne Fire Brick Company, at Fort Payne, Ala. This plant has not been operated for some time, and the new purchasers will at once put the plant in operation, turning out a high grade of fire brick and other refractories.

The Hill & Karnes Brick Company, of Paducah, Ky., recently booked an order calling for over 1,000,000 brick for Metropolis, Ill., which is probably the largest individual order for brick ever received by a western Kentucky brick concern. The brick are being delivered as fast as the company can get the cars in which to ship them.

The Western Brick Company, of Danville, Ill., one of the largest brickmaking concerns of the Middle West, voluntarily increased the wages of all its employes 5 per cent., beginning December 1. The company announces that the raise is made as an appreciation of the men, who have stood loyally by the company and worked hard to make the business so successful.

John C. McDonald, for more than thirty-five years a brick manufacturer of Detroit, Mich., celebrated his eighty-second birthday November 29. Mr. McDonald is operating his brick and tile plant on the farm where he was born, and which his father purchased in 1822 at a cost of $4.00 per acre. The same land is now worth about $3,000 an acre.

The Harbison-Walker Refractories Company, Pittsburg, Pa., has issued its statement for the year ended September 30, 1916, which will be presented at the annual meeting of stockholders, to be held January 15 next. It shows earnings of $4,305,450, after deducting $685,783 for expenditures and ordinary repairs and depreciation on plants. The sum of $764,846 was charged against extraordinary expenditures for improvements, etc., leaving net profits of the year of $3,540,604. Dividends amounting to $576,000 on the preferred stock and $1,260,000 on the common stock were paid, leaving a surplus of $1,704,000, which, added to the surplus at the close of the preceding fiscal year, brings the total surplus as of September 30, 1916, up to $8,547,257. The net of $3,540,604 compares with net of $1,498,889 in 1915 and $1,124,988 in 1914. In the three previous years dividends of $576,000 were paid

(Continued on page 566.)

Sunbury, Pa. Brick pavement laid in 1891 and filled with Barrett's Paving Pitch. The street car tracks were laid some time thereafter without injury to the pavement.

Barrett's PAVING PITCH

Makes your track paving frost-proof

LAST Spring the Electric Railway Journal collected photographs showing various brick and wood block pavements which had "heaved up" adjoining street car rails through the action of frost. Dampness and water had gotten through the pavement by reason of the inadequacy of the filler, had frozen and expanded underneath and caused upheaval along the rails which in many cases necessitated costly repairs.

Cement filler never stays tight adjoining street car rails. The vibration of the rails pulverizes it like a hammer. Asphalt filler usually cleaves from the blocks too easily to give satisfactory protection, while sand filler, of course, does not even attempt to close the joints against moisture.

Barrett's Paving Pitch, however, is so plastic and has such high natural adhesion to the brick, stone or wood block that it maintains a perfect seal through summer and winter. When the blocks contract in cold weather, the pitch simply sinks a little lower in the joints but never lets go of the blocks.

Likewise in warm weather Barrett's Paving Pitch makes expansion troubles unknown. *Every joint is an expansion joint.* There is never any pressure against the rails or the curb.

A pitch fillled pavement is quieter and less reverberant under the passing cars. It permits the removal of the blocks at any time for track repairs without destruction of the pavement, for the same blocks can always be put back in place.

One of the engineers of the Special Service Department of The Barrett Company has made a special study of track paving problems. The results of his study and experience are at your service.

Booklets free on request. Address our nearest office.

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New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

TRADE B MARK

EDITORIAL NOTES AND CLIPPINGS—Continued.

on preferred and $360,000 on common. The present balance is equal to 16.46 per cent. on the common.

George Hatfield, one of the members of the firm of the Royal Brick Company, of Connellsville, Pa., was killed instantly when caught in a cave-in at the plant.

The Hoytville Tile Company, whose plant at Hoytville, O., was destroyed by fire recently, will erect a new plant at North Baltimore, O. One hundred men will be employed.

The Baker Brick Company, of Baker, Fallon county, Mont., has been incorporated by E. S. Booth, George M. Daugherty, K. M. Zoak and others, of Baker, with a capital of $25,000.

Hood's Pottery Clay Products Company, of Atlanta, Ga., will remodel its plant at Melville, Tenn., for the manufacture of acid-proof stone and vitrified floor tile. B. M. Hood is president of the concern.

The plant of the Southern Clay Products Company, located at Mission Ridge, Ga., has been purchased by G. H. and F. L. Miller. The new owners will put it in operation at once, turning out about 50,000 brick per day.

F. G. Wilson, for many years associated with S. B. Dobbs, the well-known brick dealer of Philadelphia, Pa., has started in business for himself. He has opened offices in the Hale building, Philadelphia, and will conduct business under the firm name of F. G. Wilson & Co., dealers in brick.

The Samson Brick and Clay Company, of Cleveland, O., is the name of a new concern that has taken over the plant of the Ohio Face Brick Company, at Fredericksburg, O., and will put same in shape to manufacture 20,000 brick per day. Those interested in the company are Frank Nutting, D. H. Adolph Pritschan, Frank C. Smith and William Balhour.

B. H. Richards, of the Richards Brick Company, Edwardsville, Ill., reports that the plant had so many orders for brick that it will work full capacity throughout the winter. The plant is now completing two big contracts. One is for 800,000 brick for a high school building at Sullivan, Ill., and the other is an order for 500,000 brick for a new tannery at Woodriver.

The Lima Hollow Brick Company, recently incorporated, has taken over the plant of the National Roofing Tile Company at Lima, O., and will begin operations about the first of the year with an initial capacity of 75,000 brick per day. The company will install new machinery and make material extensions to the kilns.

The parents of George W. Kayes, an employe of the American Brick and Tile Company, at Mason City, Ia., who was electrocuted last March while working for the company, were awarded $1,500 in accordance with the Workmen's Compensation Act, the amount being based on 50 per cent. of the deceased's wages for 300 weeks.

The Brillion Brick and Tile Company, of Brillion, Wis., has enjoyed a very prosperous season, having turned out a total of 250,000 brick this year. Activities in the building line offered a fine opportunity for the concern to dispose of its output, and its sales department was successful in landing enough orders to take care of all the brick that could possibly be manufactured at the plant.

Frank Kasten, national president of the United Brick and Clayworkers' Union, was recently indicted by the grand jury at Brazil, Ind., on a charge of inciting rioting clayworkers to commit acts of violence by attacking men who went back to work in the clay plants, and shooting through their houses. Thomas Hutton, the president of the local union of clayworkers, has also been indicted.

James M. Rhoads, a brick manufacturer of Harrisburg, Pa., was stricken with heart disease while driving in his machine. Seeming to realize what was about to happen, he put on the brakes and stopped the machine before the other occupants of the car knew there was anything wrong. He had been engaged in the brick business for about twenty-four years. A widow and two daughters survive.

The American Hollow Tile Company, recently incorporated for the purpose of manufacturing and dealing in brick, tile and similar articles, has started operations at the B. H. Reed & Brothers' brickyard, Hightstown, N. J., which the company recently purchased. The incorporators are: Charles Kimball, Robert W. and William J. Lyle, of New Brunswick. The company expects to give employment to at least sixty men within a few weeks. Work has been started on the building of a 32-foot kiln, and later another large one will be constructed. Three of the Reed kilns will be utilized. Six tunnels of dryers and a large storage shed will also be erected.

PIONEER OHIO CLAYWORKER DIES IN CALIFORNIA.

T. B. Townsend, one of the oldest brick manufacturers and contractors in Ohio, died at Los Angeles, Cal., November 24, following a ten days' illness from a complication of diseases. With him at the time of his death were his son, O. N. Townsend, and his two daughters, Mrs. R. C. Burton and Mrs. L. K. Brown, of Zanesville, Ohio. The funeral was held at Zanesville, where Mr. Townsend had lived since the early sixties.

Mr. Townsend was the founder of the T. B. Townsend Brick & Contracting Company, and was active in the management of that concern until he retired from business life some ten years ago.

BEAUTIFUL BUSINESS.

By Charles Henry Mackintosh, Rotary Club of Duluth.
(Reprinted from "Logging" by permission.)

"Business is business, and Art is art—
  And the twain shall never meet?"
Why, Art is business and business Art!
The twain can never be torn apart,
For the one is the body, the other the heart,
  And the twain is the form complete.

"Business is sordid with self and greed
  And Art is a selfish thing?"
Why, business is merely a human need,
Thought out and wrought out and done in deed,
With "Service, not self," as its modern creed.
  What more can an artist bring?

MENTION THE CLAY-WORKER
WHEN WRITING TO ADVERTISERS
MENTION THE CLAY-WORKER

SOLUTION

Is the goal for which tile and brick manufacturers have striven. Some way of burning the bottom of kiln when top was finished. The top over-burned, the bottom hardly warm—but you will find this is the only way

FOR SURE BURNING

Without waste of time, fuel or ware. Old remodeled kilns work like new, and it's a system that can be installed with single or multiple stacks. Fits your kiln whether round or rectangular. It's cheap to build and easy to operate. This system makes money for its users in the face of high priced coal and labor, and it

IS FOUND

by this practical invention that better ware is produced at a lower cost, 75 per cent. of the moisture removed above the floor level. When all is taken off through the bottom, it furnishes a resistance to heat that takes hours to overcome and remove. This system gives the ware a direct heat application both top and bottom.

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OHIO KILN CO., Vigo, Ohio
Low Prices on Kiln Iron and Firebrick.

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Consulting Engineer to the Clay Industries

414 Schultz Building, Columbus, Ohio

Thirty Years' Experience in Clayworking.

GEOLOGICAL EXAMINATION OF PROPERTIES

CLAY TESTING

INVESTIGATION OF MANUFACTURING PROPOSITIONS

PLANTS DESIGNED, CONSTRUCTION SUPERINTENDED AND OPERATIONS DIRECTED

DRYERS, FURNACES, KILNS

REMODELING OLD PLANTS GIVEN SPECIAL ATTENTION

DEVELOPMENT OF NEW LINES OF PRODUCTS

APPRAISAL OF PLANTS

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE AMOUNT of late building to be noted on the Pacific Coast this month is greatly in excess of last year's record for this late date, and the prospect is for continued building activity all winter in so far as the weather permits. Thus far, the weather has not interfered materially. The San Francisco building permits for November show a big increase over the month of October, the former being in valuation $1,968,182, or almost double the October record and two-thirds of a million greater than November, 1915. The Los Angeles permits for November come to almost a million and a half, a substantial increase over last year at this time and a smaller increase over October of this year. In Seattle and Portland the November permits show a big falling off, as is usual in the North at this season. Building continued late in the North, however, and the prospects for spring are apparently as favorable as in California. The clay products manufacturers of the Pacific Coast have lately shown a disposition to employ educational methods in encouraging the use of brick and other materials in buildings of the smaller type. This tendency is especially noticeable in the Northwest. Here, in the heart of a vast lumber district, figures have been produced to show that a brick residence of reasonable proportions can be put up at no more than a third greater cost than wood. This means, of course, considering the lasting qualities of clay products, a better building for less actual cost than frame, in the long run.

The terra cotta market on the Coast is still very healthy, the demand being probably heavier now than a month ago. High-grade terra cotta products are receiving some attention in the export market, and it is likely that a demand will grow in time to fair proportions in the islands of the Pacific and in the Orient. Pressed brick shows steady demand, and unless work on numerous large buildings has to be stopped on account of rains, the brick deliveries must continue indefinitely. Some concerns are working capacity and are still far behind on deliveries. This is more especially the case with common brick.

The Steiger Terra Cotta & Pottery Co. has had a fine season on vitrified sewer pipe, considerable quantities of which were destined for the island trade. Among the contracts recently awarded to the company are: The terra cotta for the new Hall of Justice at Sacramento; the Carnegie library of Sacramento, and terra cotta for the new county court house at Grants Pass, Ore. Terra cotta is also being delivered on a number of smaller jobs, such as the addition to the St. Patrick's Seminary at Menlo Park, Cal., and the new high school at South San Francisco.

L. R. Dennison, who has been superintendent of the factory of the Steiger Terra Cotta & Pottery Co., at South San Francisco, has been promoted to the post of manager of the company, to succeed L. A. Steiger, who resigned after a service of a number of years.

Gladding, McBean & Co. report a rejuvenated demand on high-class terra cotta products and that the pressed face brick market looks promising. Peter McBean, president of the company, has just returned from an extended trip to a number of the important clay product manufacturing plants of the East.

The California Pottery Co., of Oakland, is being repainted and improved in minor respects this month. A deep well has been drilled to supply the plant with water. Next spring the company expects to manufacture their paving brick at Valley Springs, in Calaveras county, at the site of their clay deposits. The brick can be much more economically produced on the spot. The demand for the company's paving brick has been favorable this summer, and all the limited supply turned out at the Oakland plant has been readily salable. The biggest business of the company in the past year has been on vitrified sewer pipe. Vast quantities of this product are used in the sanitary improvement work of San Francisco.

The sewer contractors of San Francisco have organized an association which is known as the San Francisco Contractors' Association. The headquarters of the new organization is at Rooms 357-359, Phelan Building. The secretary-manager is Frank G. O'Kane.

Mr. Tupper, of the Western Lime & Cement Co., San Francisco, who has also been the sales manager of the San Jose Brick Co. for the past few years, has bought out the latter concern from the owner, Mrs. Doherty, whose husband operated the plant for years when he was alive. The business is one of the largest in the brick trade in the vicinity of San Francisco. Mr. Tupper will conduct the business along the same lines as heretofore.

The Pratt Building Material Co., San Francisco, has signed a contract to supply Hercules interlocking tile for the handsome new Butler residence at Auburn, Cal.

The manufacturers of cement sewer pipe in the South have protested to the city council in Los Angeles against the exclusive use of vitrified sewer pipe in the city sanitary improvement work. They claim that the new glazed cement pipe is suitable, but the clay products manufacturers replied with a letter setting forth the merits of vitrified pipe and the demerits of cement pipe. This letter was signed by the most prominent manufacturers in the South and it urged that no change be made in the public specifications for sanitary sewer work. It was shown that in years past cement sewer pipe used in Los Angeles had proven a failure.

A. W. Roberts, of Globe, Ariz., is promoting a new clay products concern, which will make a bright red brick of fine quality from clay discovered in the vicinity of Mr. Roberts. Machinery is expected to arrive shortly and operations are expected to begin about the first of February.

The Sunset Potteries, Inc., a new concern in the clay products industry, has been organized at Reno, Nev. The company is capitalized for $250,000 and the directors named are R. W. Fitzgerald, Jr., F. R. Gibson, G. W. Taylor, E. Cheney and J. S. Sinai.

The Heyburn Brick & Tile Co., Boise, Idaho, with a capitalization of $10,000, has been incorporated by L. St. Clair, H. G., V. T. and Joe Pullman.

There is a possibility of an important art pottery concern being established near San Rafael, Cal., to develop some clay deposits near Forest Knolls. These deposits were discovered by H. T. Eperson, 117 Grant avenue, San Francisco, and several local business men are said to be interested in the project. The clay is adapted for high-class art pottery of various kinds.

The first kiln of brick has been burned at the fine new brick plant of the Moscow Fire Brick & Clay Co., of Moscow, Idaho. The kiln was of 300,000 brick and the product was most satisfactory. These brick are being used on the premises.

It is being planned that the new $125,000 plant of the Warrenton Clay Co. shall be ready for operation early next spring. This plant is located at Seaside, Ore. A crew is now engaged in the construction of a four-story building of tile walls. The machinery has been ordered from the East. The main buildngi will cover a space of 80 by 120 feet.

The Solano Brick Yard, west of Blythe, Cal., has been taken over by the Blythe Freighting & Lumber Co. A first kiln of 100,000 is being burned by the new management. The manager of the works is H. Lyter, an expert brickmaker, formerly with the Simonds Brick Co., of Los Angeles.

San Francisco, Cal., December 5. SUNSET.

It is a whole lot better, and cheaper in the end, to employ someone to look closely into credit risks before they are taken than to hire a lawyer or collection agency to collect difficult accounts.

Coal! Labor! Time!

These are the three important factors in burning clay products. Getting the most effective results from them spells

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Underwood Producer Gas Burning System

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There are many other advantages to this system of burning; in a word, it is the ne plus ultra in burning clay products in periodic kilns.

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Seventy-Eight Million Wire-Cut Lug Brick Sold in Three Months

The first shipment of Wire-Cut Lug brick was made late in 1910. That year, 2,225,800 were sold.

138,276,174 Wire-Cut Lug Brick were sold in 1915.

78,000,000 Wire-Cut Lug Brick were sold during the quarter ending October 31, 1916.

The sales for 1916 greatly exceed the sales for 1913 by many millions.

Cities, counties and states specify Wire-Cut Lug Brick exclusively for brick paving and highway work.

Used on Lincoln Highway and Dixie Highway.

Made by 39 independent, competing companies operating 62 plants in all states.

WRITE FOR DATA

LICENSED MANUFACTURERS:

Corry Brick & Tile Company, Corry, Pa.

United Brick Company, Greensburg, Pa. Plant at Conneaut, Ohio.

Sterling Brick Company, Olean, N. Y.

Reynoldsville Brick & Tile Co., Reynoldsville, Pa.

Danville Brick Company, Danville, Ill.

Clinton Paving Brick Company, Clinton, Ind.

Alton Brick Company, Alton, Ill.

Metal Paving Brick Company, Cleveland, Ohio. Plants at Cleveland, Carrolton, Malvern and Wooster, Ohio.

Metropolitan Paving Brick Company, Canton, Ohio. Four plants at Canton, Ohio, and one at Willow, Ohio.

Bessemer Limestone Company, Youngstown, Ohio. Three plants at Bessemer, Pa.

Peeble Paving Brick Company, Portsmouth, Ohio. Two plants at Portsmouth, Ohio, and one at Firebrick, Ky.

Murphysboro Paving Brick Company, Murphysboro, Ill.

Southern Clay Manufacturing Co., Chattanooga, Tenn. Plants at Robbins, Tenn., and Coaldale, Ala., Birmingham, Ala.

McAvoy Vitrified Brick Company, Philadelphia, Pa. Plant at Perkiomen Junction, Pa.

Windsor Brick Company, Akron, Ohio.

Hocking Valley Brick Company, Columbus, Ohio. Plant at Logan, Ohio.

Veedersburg Paver Company, Veedersburg, Ind.

Springfield Paving Brick Company, Springfield, Ill.

Terre Haute Vitrified Brick Co., Terre Haute, Ind.

Albion Vitrified Brick Company, Albion, Ill.

Alliance Clay Product Company, Alliance, Ohio.

The John Kline Brick Co., Wickliffe, O.

Westport Paving Brick Company, Baltimore, Md.

Mack Manufacturing Company, New Cumberland, W. Va. Four plants at New Cumberland, W. Va.

Hydraulic-Press Brick Company, St. Louis, Mo.

Barr Clay Company, Streator, Ill.

Burton-Townsend Company, Zanesville, Ohio. Two plants at Zanesville, Ohio.

Trimble Paving Brick Company, Dayton, Ohio. One plant at Trimble, Ohio, one plant at Glouster, Ohio.

Thornton Fire Brick Company, Clarksburg, W. Va. One plant at Thornton, W. Va.

Indiana Paving Brick & Block Co., Brazil, Ind.

Standard Brick Company, Crawfordsville, Ind.

Shawmut Paving Brick Works, Shawmut, Pa.

The Pennsylvania Clay Co., Pittsburgh, Pa.

The Clyesdale Brick & Clay Co., Pittsburgh, Pa.

Streator Clay Manufacturing Co., Streator, Ill.

Martinsville Brick Company, Martinsville, Ind.

Cleveland Brick & Clay Co., Cleveland, Ohio.

Jamestown Shale Paving Brick Co., Jamestown, N. Y.

Purington Paving Brick Co., Galesburg, Ill. Four plants.

The Dunn Wire-Cut Lug Brick Co., Conneaut, O.

(LICENSORS)

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By special agreement we have arranged a remarkable money-saving introductory campaign through which our readers may obtain THE CLAY-WORKER in club with splendid periodicals for the home, for only a fraction of their real value.

The Publishers Will Mail the Magazine Direct From Their Own Office to You

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Subscriptions may commence with any month. The magazines may be sent to one address or each to a different address. This gives you an opportunity to have your friends subscribe with you or to use the magazine subscriptions as gifts to your friends or relatives. Each subscription is for one year. Extra postage is necessary on Canadian and Foreign subscriptions.

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Delineator	1.50	3.50
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THE CLAY-WORKER	$2.00	
Review of Reviews or World's Work	3.00	3.50
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THE CLAY-WORKER	$2.00	
Scribner's or Current History or Collier's Weekly	3.00	3.50
Regular Price	$5.00	
THE CLAY-WORKER	$2.00	
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If none of the foregoing combinations is just what you want, write us for special prices on any magazine or papers desired and we will quote you equally low prices.

Send all orders to The Clay-Worker.

T. A. Randall & Co., Publishers Clay-Worker, Indianapolis:

You will please send The Clay-Worker and the other magazines named below to me for the ensuing year beginning with the next current issue of each, for which I enclose $....................

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Street and No...........................State............

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Do YOU Ever Have Any?

HOOK DOWN DRAFT KILN USERS DON'T

Easy to say, but a joy if you can back it up. WE CAN. Nice, uniform burns always, with a big percentage LESS coal than ordinarily used and in LESS than the ordinary time, frequently half. Like everything good, it's simple; the answer can be given in a word—DISTRIBUTION. The heat isn't led to the outside by the shortest possible route, but evenly distributed and held in the kiln, without cutting the draft, as you do when you drop the damper at the stack. A well-known ceramic engineer once said that if he could, he would like to put the damper just below the floor. That is the effect the Hook Down Draft System produces.

In the past five years many clayworkers have tried it out and like it. Dozens of plants now use this system, many exclusively. It costs only a stamp to investigate. IF IT'S GOOD, YOU WANT IT.

When you write—today—give us the number and size of your kilns, your present burning time and fuel consumption, and we can estimate the saving which the Hook System can make for you.

HOOK PATENT KILN CO.
Corner Spring and High Streets
Commerce Bldg., Columbus, Ohio
Kiln Bands, Grate Bars and All Accessories.

WHO CUT THE PRICE

(Continued from page 537.)

Mrs. Holme: "I like that very much, but desired to make sure that you understand that we wanted the medium shade, slightly lighter than Mr. Cathcart's house."

E. Z. Bye: "Yes, I understand it was the medium shade and I have so closed the order with the contractor. We think this is a very remarkable brick and has an individuality which no other brick on the market possesses today, and I was very sorry to learn that you liked John's 4760 as well as you did this brick."

Mrs. Holme: "But we did not. We looked at his brick before we looked at yours, and we didn't like it at all."

E. Z. Bye: "Well, I am very glad to know this, and you may rest assured, Mrs. Holme and Mr. Art Work, that we will do everything in our power to make this a beautiful job, fully up to your expectations. All of these brick are stacked on our yards, awaiting delivery. Goodbye Mrs. Holme and Mr. Art Work.'" (Exit Mrs. Holme and Mr. Art Work.)

E. Z. Bye: "Can you beat that?" (Grabbing his hat, exit.)

Enter Mr. Contractor (looking over his estimates): "Well, I wonder how about deliveries. This contracting is getting to be a strenuous game. I figured out a pretty good profit. Now, let's see. On my original figures, I could break just about even. I saved $100.00 on that prepared roofing, $50.00 on hardware, $100.00 on excavating. All together, I guess I made a good round 15 per cent. I would have made 30 per cent. if it had not been for those fool lumber, cement and steel fellows. I paid them a good profit on their advance. I cannot understand how they fluctuate so. Oh, well, I should worry. I made it up on those brick fellows. Saved a little on common brick, too. I am some buyer. If it were not for my ability along these lines I could not stay in the business. Let me see. I can save a little interest, too, by staving off E. Z. Well, I cannot wait any longer." (Exit.)

Time—Two months.

Enter E. Z. Bye and John Dough: "Say, John, I have been trying to think to talk to you about that job for Mrs. Holme. She has a fine residence. I was up to her house-warming the other evening."

John Dough: "Yes, that is sure a fine job, and the beauty of it is, that you got your price along with it."

E. Z. Bye: "But I didn't. Mr. Contractor told me that your No. 4760 was just as satisfactory as my brick and you had made a quotation of $15.00 and after haggling with him, I met your price."

John Dough: "Our No. 4760 is worth $18.00 of anybody's money. This is the lowest price we will quote, even when we are dead sure of getting our money, and Mr. Contractor knows as well as I that I have absolutely refused to take his trade for the past year. Has he settled with you, yet?"

E. Z. Bye: "No, but his credit is good to me. I thought he was good."

John Dough: "He was until he ruined himself on that Griggsville court house."

E. Z. Bye: "John, we should have some way of determining the credit of our contractors and some way of telling when a man is deliberately lying to you. Do you really believe there is something which tells when a man is lying?"

John Dough: "I know it."

E. Z. Bye: "Perhaps you have seen one of these instruments."

John Dough: "Seen one! I married one!"

E. Z. Bye: "All joking aside, let's pitch in and see if we cannot help that Secretary make our association a real live business organization, distributing worth-while information in all lines of clay effort."

John Dough: "We have the best material on top of earth if we would advertise it, and spend half of our needless selling expense in promoting and making new business."

E. Z. Bye: "Let us become a factor in this little world of ours, not the laughing stock of every contractor in the country, nor a bank account for them, either."

John Dough: "Well, you know there is Griggsville. They will not agree to anything of this character. They have been selling below cost for five years, to my knowledge. You know I used to be a director in that company."

E. Z. Bye: "Well, I believe we can convince them that they should get cost, and maybe just a little bit more to keep their wives and families. Say, John, I have been in the brick business a long time, as you know, and I sometimes feel that I will leave my son a wonderful heritage, principally an enviable reputation."

John Dough: "You will leave your wife a wash tub and a looking glass. She can either take in washings or watch herself starve to death."

E. Z. Bye: "You are dead right."

John Dough: "All right, E. Z., from now on we cease fighting one another so hard and fight our common enemies. I don't care whether you get the order or whether I do, so long as my yearly average is kept up."

E. Z. Bye: "We will dispense of two men each on our selling force and each put out a man to promote brick. Let's go over and see that Secretary." (Exit.)

Time—One year.

Enter office man with large blackboard, headed "Quotations, February 8, 1917." (1917 underlined.) Names of several Illinois towns under which names there are quotations for each town and specifying grades, as: A1, A2, etc., prices ranging from $25.00 to $40.00 and varying for different towns. Clock on the wall pointed to the hour of 9 o'clock. Enter both brick men, who casually take off their gloves, overcoats and hats. Glance over at quotations, which are being placed by the office man on the board. Prices are gradually erased and raised, similar to Board of Trade procedure. First man goes to telephone.

"Give me John Jones, at Chicago, Illinois." (Remains on wire. Jiggles hook after slight delay.) "Operator, can you get John Jones?—Oh, you have him. All right. Hello, John. How about brick?—Did you say a million?—Let me look. (Gets up and looks at board.) Prices are strong this morning and going up. I will sell you this order for $42.50—All right. Booked for your south yards." (Hanging up telephone receiver.) "Say, John, this is the life. How different from the old days."

John Dough: "That was a long, hard pull to beat some sense into the brick fellows, but they are sure a factor in this little world of ours, now."

E. Z. Bye: "All up and coming, energetic, after the business every minute."

(Exit office man.)

John Dough: "You bet. A year ago we would not think of getting down to the office at 9 o'clock.."

E. Z. Bye: "But then we are forgiven, we were out last night."

John Dough: "My wife said as we came home that she was very glad that we could begin to enjoy a few of the small pleasures and then she commenced to dream about our youngsters. You know they are getting along now and we have commenced to figure for them. My boy is going to the plant with me and is going to study a little architecture and get out around to see what is being done in artistic ways in our line, so that when I get ready to shuffle off, he can fill my shoes."

E. Z. Bye: "Say, John, I made a will the other day and I willed my wife one-half the stock in my company and my girl and boy, each one-fourth, and I thought when I did it how differently I looked at this than we did some time ago, when we talked this matter over."

(Continued on page 574.)

GANDY and Gases

"We are pleased to advise you that the Gandy Belting we have been using for some time in our forging shop has given us excellent satisfaction. We use it in places where it is exposed to the heat and gases in preference to anything else we have ever tried. We would recommend it to any one being obliged to expose a belt to such conditions."

THE gases common to some manufacturing operations and so unavoidable in many plants, are exceedingly harmful to most belting.

This letter shows what action a manufacturer should take when he learns that such conditions are shortening the life and service of his belts.

Aside from being advantageous in duties such as this, GANDY belts are equally superior in conditions where oil, steam, water, heat and dust are encountered.

Gandy belts in all kinds of belt service, live up to the reputation for dependable service that they have gained in 39 years. They are ready to prove themselves dependable in your work—and save you money at the same time.

Prices, samples and full information sent upon request.

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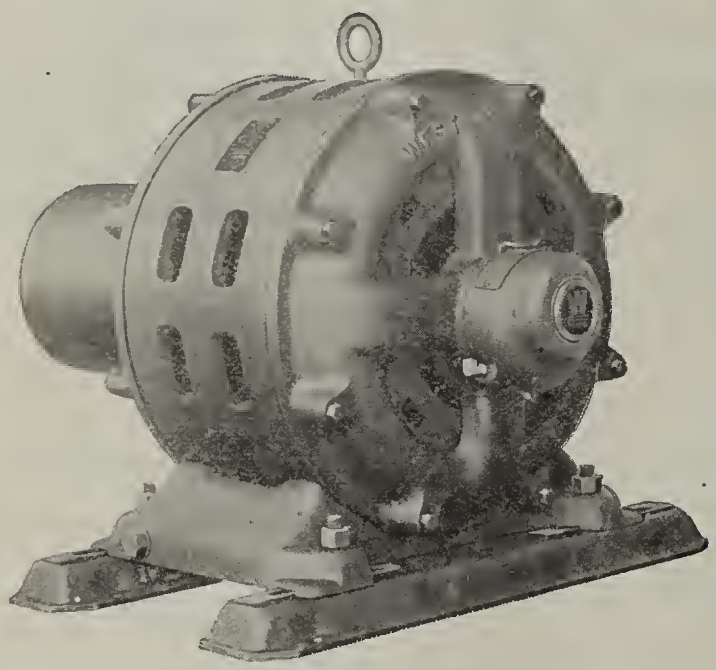

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One Contract---
One Responsibility

is what you secure in specifying

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Electrical
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We are in position to supply equipment from the steam supply to the productive machine; this includes—

Stokers, Turbines, Generators, Switchboards, Protective Apparatus, Motors. Lighting Equipment, etc.

Without obligation on your part our engineers will be glad to solve your power problems.

A card to our nearest office will bring full information.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.
Sales offices in all large American cities.

WHO CUT THE PRICE?

(Continued from page 573.)

John Dough: "Well, I am sold up. How about you?"

E. Z. Bye: "Oh, I have enough advance orders for the next six months. Let's go over to the club."

John Dough: "Well, let's get on the train and go to Detroit and help that promoter of ours on that new Ford plant job. I guess with our affiliations we can outweigh the competition. You know the way concrete swung the last job for him some years ago was by the influential men in their industries who were associated with him in his new venture."

E. Z. Bye: "All right. I also heard yesterday that Edison had constructed a new brick laboratory building for the testing of re-inforced brick work. My, but that man had a change of heart."

(Curtain.)

RAILWAY PREPAREDNESS.

We have in this country, without any question of doubt, the greatest system of railroads in the world, not only more of them and better equipped, but they are able to pay the highest wages and yet give the best service at the lowest cost of any railroads in the world.

Perhaps it is the knowledge of this superiority which begets some of the strange contrasts and contradictions presented by our railway friends, and perhaps they overlook the fact that while we have more railway facilities than any other country, we also have a much greater need for them to take care of our industrial traffic. Also, perhaps our railway friends get so busy admiring themselves and their perfection occasionally that they neglect the everyday matter of performing service.

Anyway, there is in the hands of the writer of this a very interesting book, full of lively matter calculated to impress the preparedness of certain railway lines for all emergencies, and this at a time, too, when the writer has just been sitting in at a two weeks' car shortage hearing, where it was shown very conclusively that the railroads of the country were not by any means prepared to handle the heavy tonnage offered them during the early winter months. The hearing came in the midst of the greatest car shortage on record, a shortage which led to the Eastern and Northern roads holding onto and using equipment of Southern and Western roads until some of the roads had twice as many cars as they owned, while others were so short of cars that they could not take care of the traffic in their home territory. One result of the shortage was to send coal prices up to unheard-of points and to cause keen suffering for coal in some parts of the country.

It is not the purpose here to go into the details of the car shortage hearing, but simply to point the fact that while we have a great system of railways and many claims of superiority, and much talk about preparedness from railway folks, there has really been much lack of foresightedness on their part and a woeful inefficiency in management. Otherwise there would never have developed such a condition as prevailed early this winter, when the tonnage movement was so heavy. Some of the railroads sought to cover their unpreparedness on the plea that in the dull times of the past they were not able to build additional equipment because freight rates were too low and the money was not available for this work. This is really begging the question, and it would sound much better, look better and be better if the railway managers of the country would simply admit that they have been caught napping, and would get seriously busy at the problem of furnishing the shipping facilities needed by the country.

The plant owner who doesn't figure on accidents is about as improvident as the man who fails to lay up something for a rainy day.

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ORIGINAL BOSS SYSTEM

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BOSS TEN-HOUR DRYER

Dries Easily the Most Tender Clays.
No Live Steam---No Drying at Night.

BOSS SYSTEM of BURNING BRICK

Use the Cheapest Slack Coal or Screenings
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Write for Catalogs.

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We can save you 25% of your fuel bill. No money until we do it. Don't you think this worth a stamp?

Then write to the

X. L. KILN & DRYER CO.
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YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

NO. 1
KNOWN THE WORLD OVER
SCHURS OIL BURNER CO.
Los Angeles, Cal.

NOTICE!
TO
BRICK MFRS.
FOR
QUICK BURNS
AND
BETTER COLOR
BURN OIL
AND USE
SCHURS BURNERS

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Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

FOR SALE.

One No. 36 American Ring Hammer pulverizer; run only a short time. Address, L. L. STEPHENSON,
8 tf d Lovick, Ala.

FOR SALE.

New Ross Keller four-mold triple pressure brick press.
EXCELSIOR TOOL & MACHINE CO.,
11 tf d East St. Louis, Ill.

FOR SALE.

500 acres Ganister rock at $20.00 per acre for quick sale. Less than one mile from P. R. R. in Centre county, Pa.
N. B. SPANGLER,
12 4 dm Bellefonte, Pa.

FOR SALE CHEAP.

One New Haven vertical brick machine and pug mill.

One Potts disintegrator.

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One 12x14-in. Automatic engine, made by the Valley Iron Works, Williamsport, Penna.

One Atlas engine, 12x20-in.

One Atlas tubular boiler, 54-in.x14-ft-0-in.

One 70-h.p. Economic boiler.

One tubular boiler, 3-ft.-6-in.x12-ft.-0-in.

Address GEO T. DICKOVER & SON,
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FOR SALE.

1—Freese Union brick machine.
1—Freese automatic rotating cutter.
1—Hetherington rattler, almost new.
1—Small concrete mixer.
1—Atlas engine, 14x26.
2—Piano wire screens.
1—No. 5 Champion crusher.
1 No. 10 Western Crusher.
24—Wellington No. 1 flat spring barrows, almost new.
100 Cast Iron Single-deck dryer cars, 26-in. gauge—almost new.
4—Turntables 24 inch gauge.
1—Boyd four mold dry press.
Wanted: 1 9-in. iron frame dry pan.
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FOR SALE.

Two Bonnot represses, almost new; used only thirty days. Address,
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One C. W. Raymond Brick & Tile machine, 20,000 brick capacity. Used as a test machine. Tile dies five to eight. Will sell cheap, as have no use for same. Also one Cooke motor 40 h.p. gasoline engine run two months. Putting in larger power plant. Address,
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On account of the death of owner will sell the following tile machinery: New Departure Mill, sizes 4 to 20 inch, Automatic Cutoff, 12 foot elevator for small tile, twenty-five hose Atlas Enginee, a lot of tile boards. This machinery all in good running order. I won't refuse any reasonable offer on a part or all of the above. Address, ARTHUR HIDY,
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FOR LEASE.

Brick plant situated on the Chesapeake & Ohio R. R. and the Kanawha river; 600 acres of clay suitable for making fire brick, coke oven brick, street pavers, buff, red and flash brick and glaze sewer tile, also pottery clay. Will lease on liberal terms. Apply to
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FOR SALE.

1—Chambers brick machine "Chicago Special," 100,000 capacity.
1—Pug mill, 10-foot.
1—Smooth roller crushing machine.
1—Williams hammer machine.
1—American blower fan, 6-foot.
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A complete wire-cut plant ready for operation, or its individual parts, consisting of Brewer Brick and Tile Machine and Conical Roll Crusher, Raymond Pug Mill, Smooth Roll Crusher and Cutting Table, National Steam Dryer, also belting pulleys and other equipment incidental to a complete plant. Write for information and bargain prices.
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WANTED, ETC.

WANTED.

Position as superintendent or burner on any kind of brick or clay plant. Best reference. BOX 10, J. A.,
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Ceramist. To person of right training and experience permanent position in architectural terra cotta plant.
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Superintendent for sand mold brick plant of large capacity in a large city. Man of middle age who is not afraid of early hours or hard work. Good salary to this kind of a man. Address,
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Superintendent for sewer pipe factory. Must be able to handle labor. References required. All communications will be treated strictly confidential. Good money to the right man. Address,
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WANTED.

A superintendent who knows the paving brick and fireproofing business. A man with the ability to run a plant without assistance. Must be sober. State age, experience and references, etc.

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A ceramic graduate who has had some experience in the clay industries to take position as a burner with a large abrasive company. Unusual opportunity to the man who can show results. State age, qualifications and salary expected in first letter. Correspondence strictly confidential. Address,

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Position as superintendent of face brick plant. Have had many years experience in the handling of men and machinery. Now located with large successful plant, but for personal reasons desire to make change. Can give best of references. Competent to take entire charge of plant.

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Thirty-Ninth Annual Convention

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Headquarters, Beardsley Hotel, Champaign, Ill.

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There will be ample opportunity for every branch of the trade to take up their individual problems. The Face Brick, Hollow Tile, Drain Tile and Common Brick men are now getting where they can talk costs and various items. These branches are and will accomplish things.

Make your reservations ***now.***

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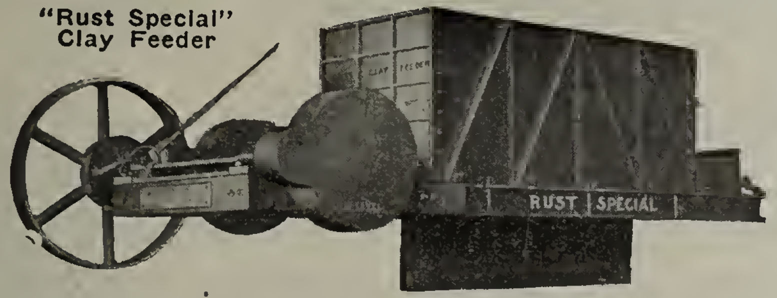
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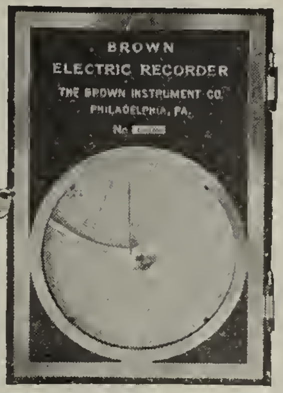
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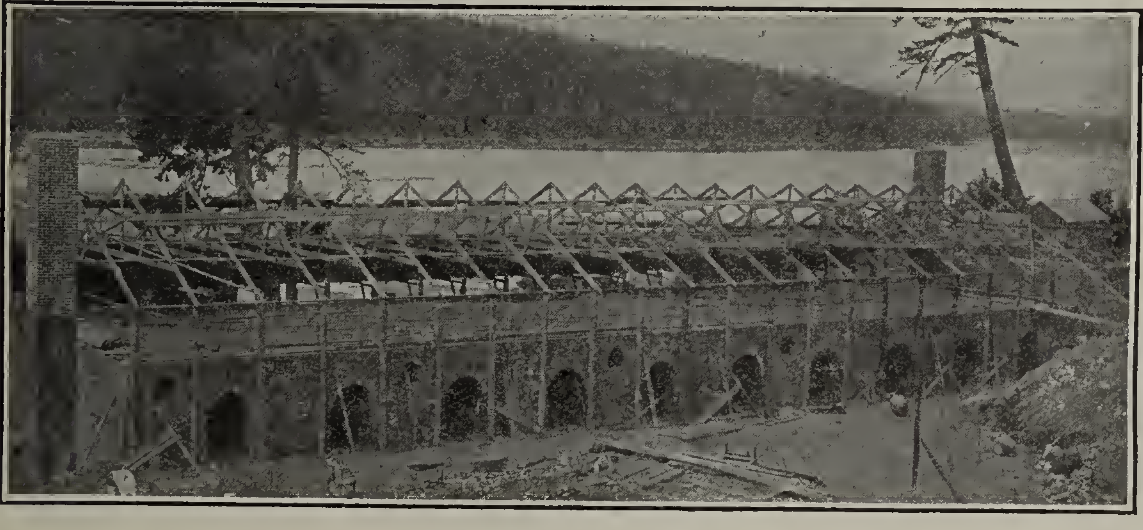
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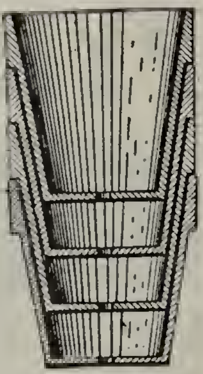

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Especially for Kiln Construction.

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Showing a difference of $42. per annum in favor of the STANDARD, equal to nearly double its initial cost. No allowance has been made in the above table for the fact that owing to its SIMPLICITY and EASE OF OPERATION, the STANDARD can be operated by YOUR MOST INEXPERIENCED OFFICE HELP. We are anxious to prove our claims in a competitive test IN YOUR OWN OFFICE AT OUR EXPENSE.

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Engineer and Patent Attorney
To the Manufacturers of
Brick, Lime, Magnesia, Silica & Ceramic Wares.
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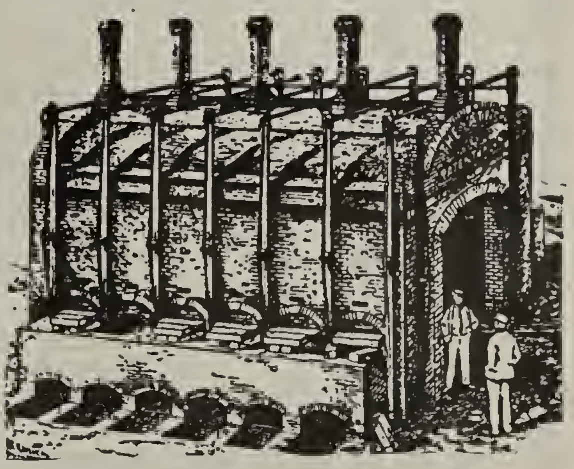

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Also Continuous Down-Draft.

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Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger. Price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers' Handbook," $2.00; a manual for all engaged in the manufacture of articles from clay. "Clays," $5.00; their occurrences, properties and uses, with special reference to those of the United States. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address,

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Brick manufacturers who have anything in the way of second-hand machinery or appliances, will find a ready market for same through a card in our Classified Advertisements. Superintendents, yard foremen, burners, etc., desiring to make a change, will do well to run a Wanted ad in our classified department. Clay-Worker ads bring results.

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Daily capacity, 20,000 finished wires.

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PYROMETERS

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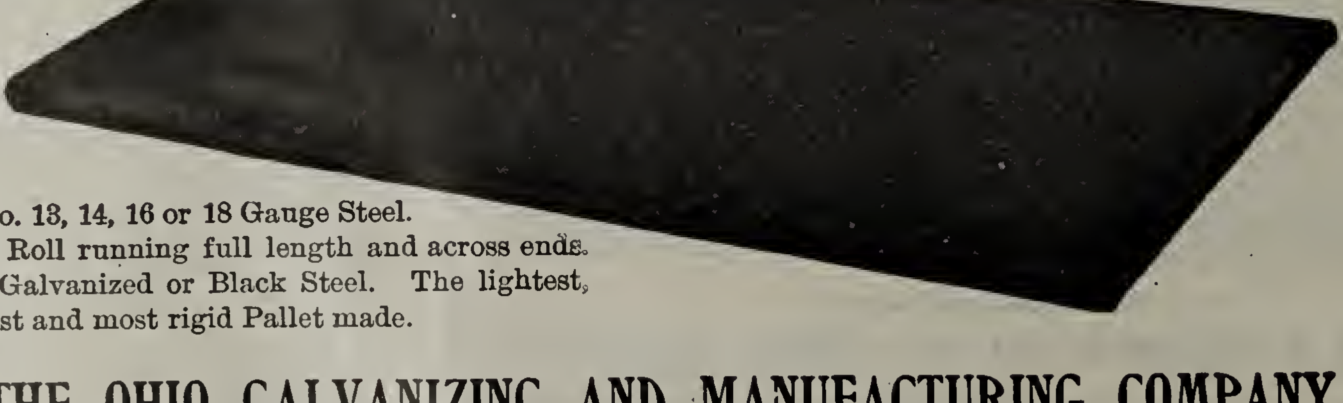

Made from No. 13, 14, 16 or 18 Gauge Steel.
⅝-inch Roll running full length and across ends.
Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

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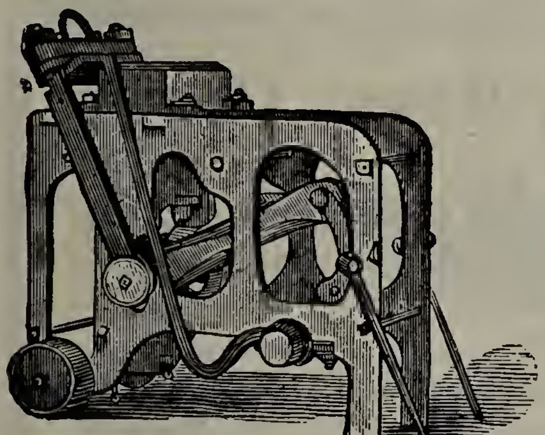

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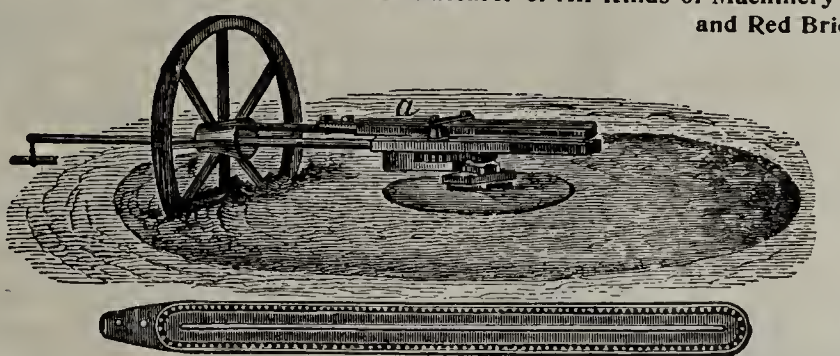

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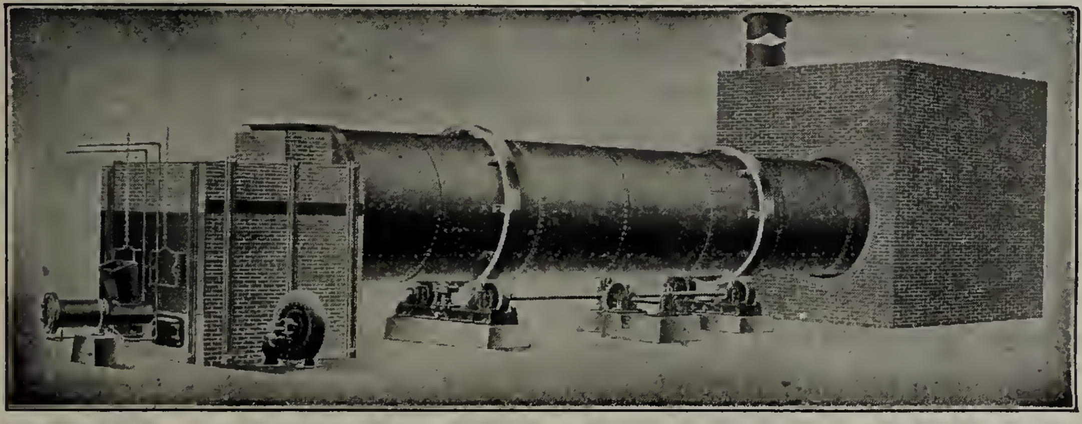

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42 Thews in Cleveland.

Ask The American Building Brick Co.; The Barkwell Brick Co.; The Cuyahoga Brick and Shale Co.; The Deckman-Duty Brick Co.; The Farr Brick Co., and *The Ohio Clay Co.* what they think of their *Thews.*

The First Thew Shovel Still in Service.

Let us show you *Thews operating* that have been *in continuous service over* 15 *years.*

Last year the sign read 37 *Thews in Detroit.*

The Thew Company refers you to any Thew Shovel owner anywhere.

They do this because the *policy of the Company will not permit a Thew* to be *sold* to *any one unless* it *can give good results.*

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Here is what the owner of the *first Thew Shovel* says after it has been *in continuous service over* 21 *years*: *"No better shovel was ever put up. It is not very handsome to look at, but it is very economical in operation and does its work without any trouble. We can't say anything too good about the shovel."*

Use a Thew--It Pays.

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COST REDUCED
QUALITY INCREASED
QUANTITY INCREASED
by using

The National Steam Drier

Ask us about it.

The National Dry Kiln Company
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BOLT IT TO THE BIN!

Investigate the
COLUMBUS CLAY FEEDER
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"O. K. in every respect, and considered one of the most important machines on our plant."

—*Extract from one of many letters.*

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ELEVATORS AND CONVEYORS
OHIO DRAFT GAUGE

ECONOMY True economy is the sure road to wealth today, just as it has ever been. This is generally conceded, but it is not always certain what constitutes true economy. In the clay line it is ofttimes real economy to replace small capacity machinery with larger in order to meet the demands of a rapidly growing trade. Really it is false economy not to do so, for one must spend money to make money. He is wise who recognizes this truth and promptly replaces outgrown machinery with that equal to his needs. Then, after you have done the wise thing in enlarging and refitting your plant, don't let the outgrown machinery go to the scrap pile. It may prove a boon to some manufacturer starting a small capacity plant for which it will be ample. There are many such and they may be reached through an ad in the For Sale columns of The Clay-Worker. Be wise, not wasteful, and instead of letting your outgrown machinery rust out, advertise it in The Clay-Worker (see forms of ads under heading "For Sale, Wanted, Etc.," in this issue) and convert it into ✤ ✤ ✤ ✤ ✤ **CASH**

To insure insertion in current issue, copy should be furnished early in the month.

Address

THE CLAY=WORKER,
Indianapolis.

100% INCREASE IN BRICK HOME CONSTRUCTION

Effect. This is the record made in Cleveland in 1916, according to figures from the City Building Department. It is double the amount of money expended for brick homes in any preceding year.

Cause. The First National Complete Building Show was held in Cleveland in February. There the brick manufacturers of the Middle West made the finest display of Face Brick ever erected. Educational literature was sent to more than 6,000 prospective home builders who visited the brick exhibit.

Opportunity.

The Second
National Complete Building Exposition
Grand Central Palace, New York
March 5, 6, 7, 8, 9, 10, 11, 1917

offers an even greater opportunity for presenting brick and increasing its use with home builders. The New York show will be national in scope, attracting the builders, architects and engineers from all parts of the country.

A Bigger and Better Show
In Every Department
The Most Beautiful Exposition Building in the World
Within a Trolley Ride of 7,000,000 People.

CONVENTIONS DURING THE SHOW:

The National Brick Manufacturers' Association,
The National Paving Brick Manufacturers' Association,
The American Ceramic Society,
and many others.

Manufacturers should not delay in making reservations for exhibition space. It is selling rapidly. Address:

The National Complete Building Exposition

Eastern Office:
Grand Central Palace,
New York.

Western Office:
Leader-News Bldg.,
Cleveland.

LET US SHOW YOU

Experience is a dear teacher. ❧ He is wise in his day and generation who profits by experience. ❧ Especially the experience of others, and thereby avoids failure and achieves success. ❧ We speak from experience and with practical knowledge, as our record proves. ❧ We are "From Missouri" and can SHOW YOU improved methods of making and burning brick and other clayware.

Our experience enables us to tell beforehand whether a certain kiln will do the work it's going to be built for. This very experience most of our competitors are lacking, which fact explains the large number of failures.

We design, construct and **operate** any style of

Coal or Gas-Fired Continuous and Periodic Kilns

provided their practical value to the clay industries has been demonstrated.

Plans for down-draft kilns furnished by us include a system of underground flues, which will facilitate a continuous operation, after a large enough battery of kilns is erected. With this system you may obtain the benefit of a continuous kiln and still be at liberty to build it by and by, as needed.

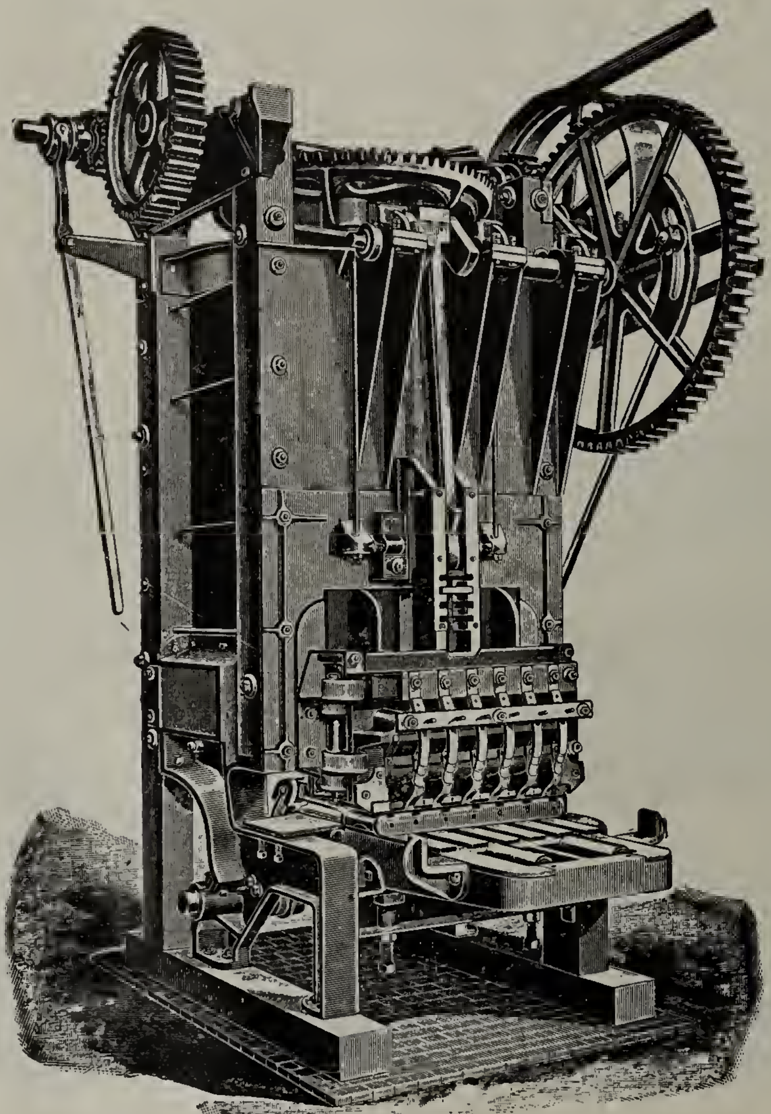
Richard B. Hoehne & Associates

Engineers and Experts to the Manufacturers of Clay Products

1218 North Vandeventer **SAINT LOUIS, MO.**

EARNING CAPACITY

The thing which gives value to any machine is its earning capacity. The earning capacity of brick machinery depends as much on strength and thorough construction as anything. Most brickmakers have learned this in the expensive School of Experience. When a machine is broken down its earning capacity and its value is gone. Continued results, therefore, determine the economic value of a machine, rather than first cost. On this basis "New Haven" Machines have proven to be the least expensive on the market.



"NEW HAVEN" VERTICAL BRICK MACHINE.

Because of their simplicity, unusual strength, and excellent construction, "New Haven" Vertical Brick Machines are seldom out of repair, and hence earn more and are much more valuable to their owners than the light weight affairs that break so often. They do better work than is possible with less powerful machines. It will pay any prospective buyer to think seriously about the matter of earning capacity, and look into the merits of the "New Haven" Machine from that point of view.

The EASTERN MACHINERY CO.

NEW HAVEN, CONN.

JOIN THE

BOOST **BOOST**

BUILD WITH BRICK

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.

IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background.

These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $6.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $7.00 per hundred. The "Drain Your Farm" sign, with firm name, costs $7.00 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

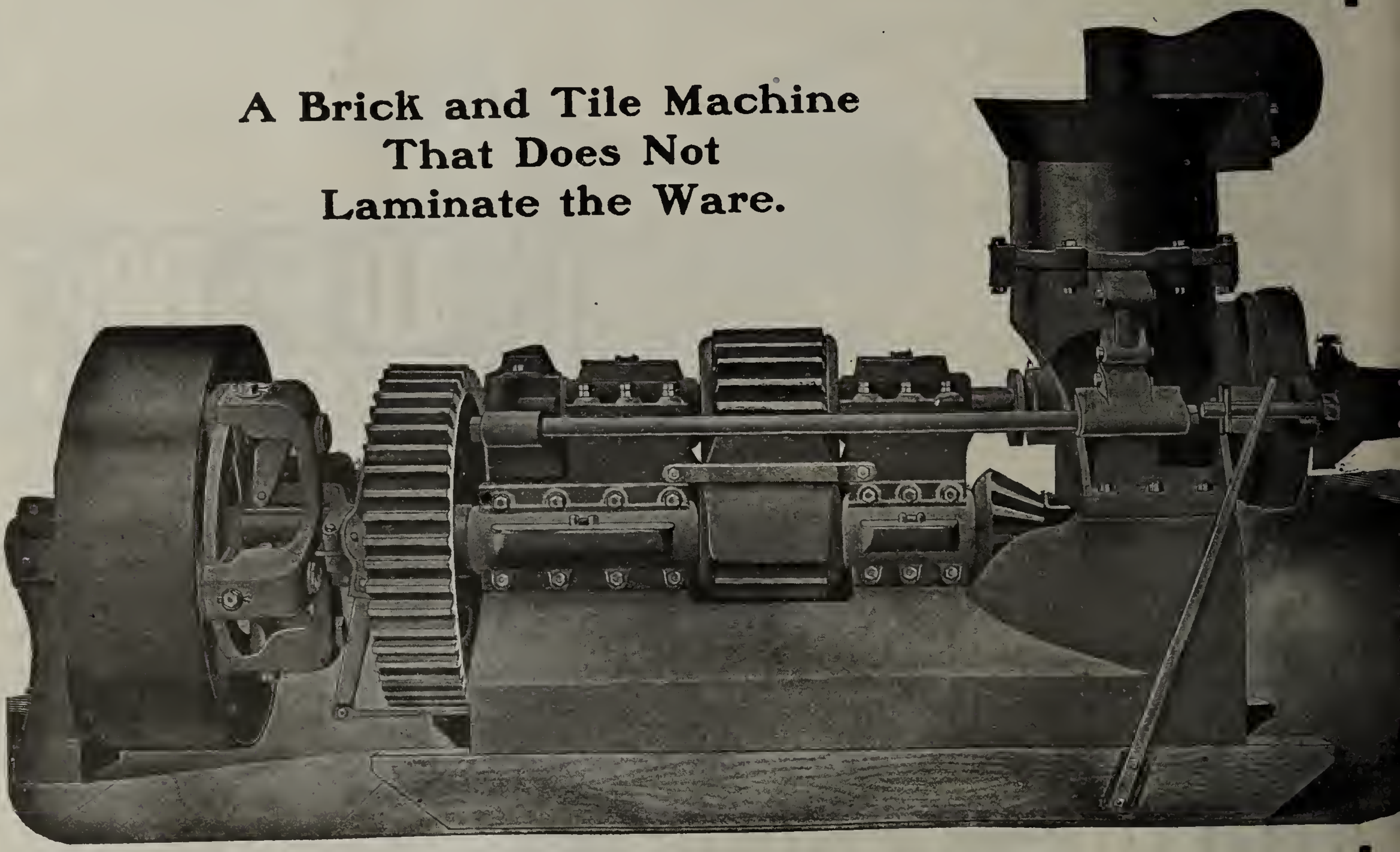
(Cross out the items not wanted, fill in and mail us the coupon.)

TURN FAILURE INTO SUCCESS

With The Wonder Machine.

A Machine of Large Capacity. Unequaled in Record of Durability.

A Brick and Tile Machine
That Does Not
Laminate the Ware.



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

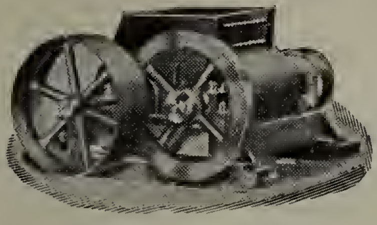
Write for Catalog and Prices.

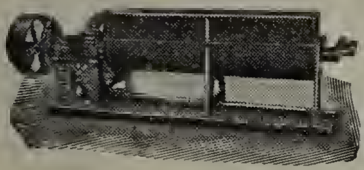
THE WALLACE MFG. CO.

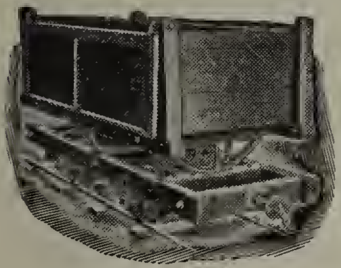
FRANKFORT, IND.

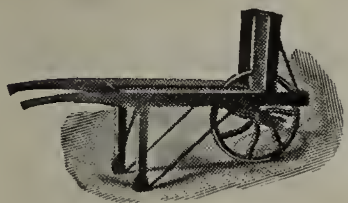
Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

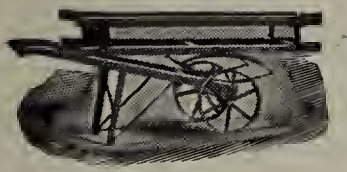
Vertical Brick Machine


Style "A" and "P" Disintegrator

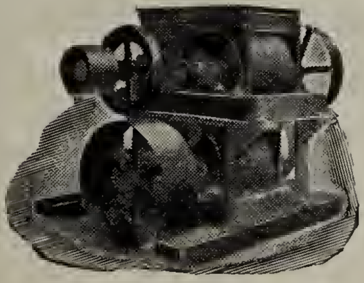

Double Geared Pug Mill

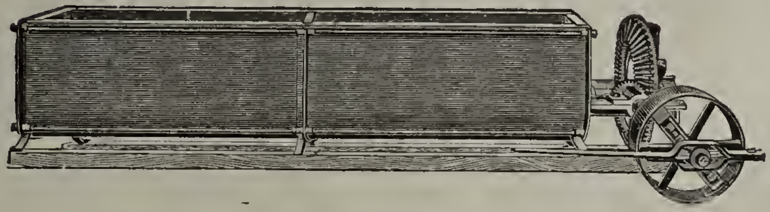

Side Dump Car


No. 6 Barrow


Double Deck Truck

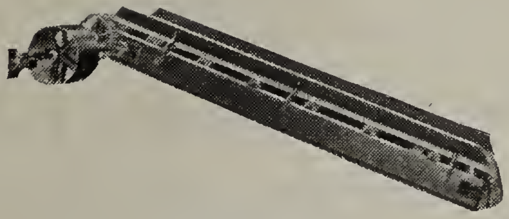
Style "A" Mould Sander

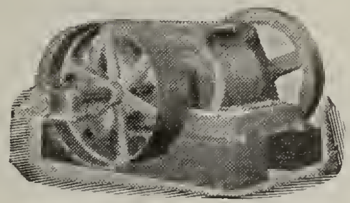

Style "P" Compound Disintegrator and Crusher

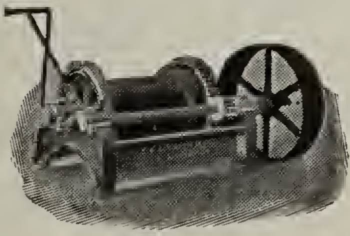

Single Geared Pug Mill

Feeder or Granulator

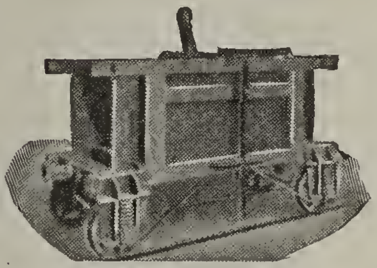
The Potts Rocker Grate
For any size fire box
on boiler or kilns

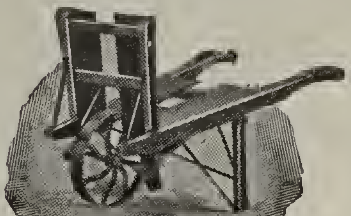

Clay Elevator.

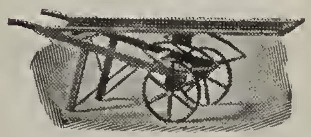

Style "P" Roller-Crusher


Style "B" Winding Drum

Mule Truck


Bottom Dump Car


No. 2 Barrow


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for Prices.

If it's to be Had We Have it.

Drying Clay Wares

By Ellis Lovejoy.

Author of

Economies in Brickyard Construction and Operation.

Scumming and Efflorescence.

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Mr. Clayworker:

Your library of ceramic literature is not complete without

DRYING CLAY WARES.

This splendid treatise covers every phase in the drying of any kind of clay ware.

It is the most valuable book of all our ceramic literature.

It is so terse and simple in its diction that it does not require a second reading to get the meaning.

The remarkable grasp of the author on this subject, his clear language, the detailed discussions and the arrangement of the subject matter make this book most interesting.

It is splendidly illustrated with sketches of the various types of dryers, etc.

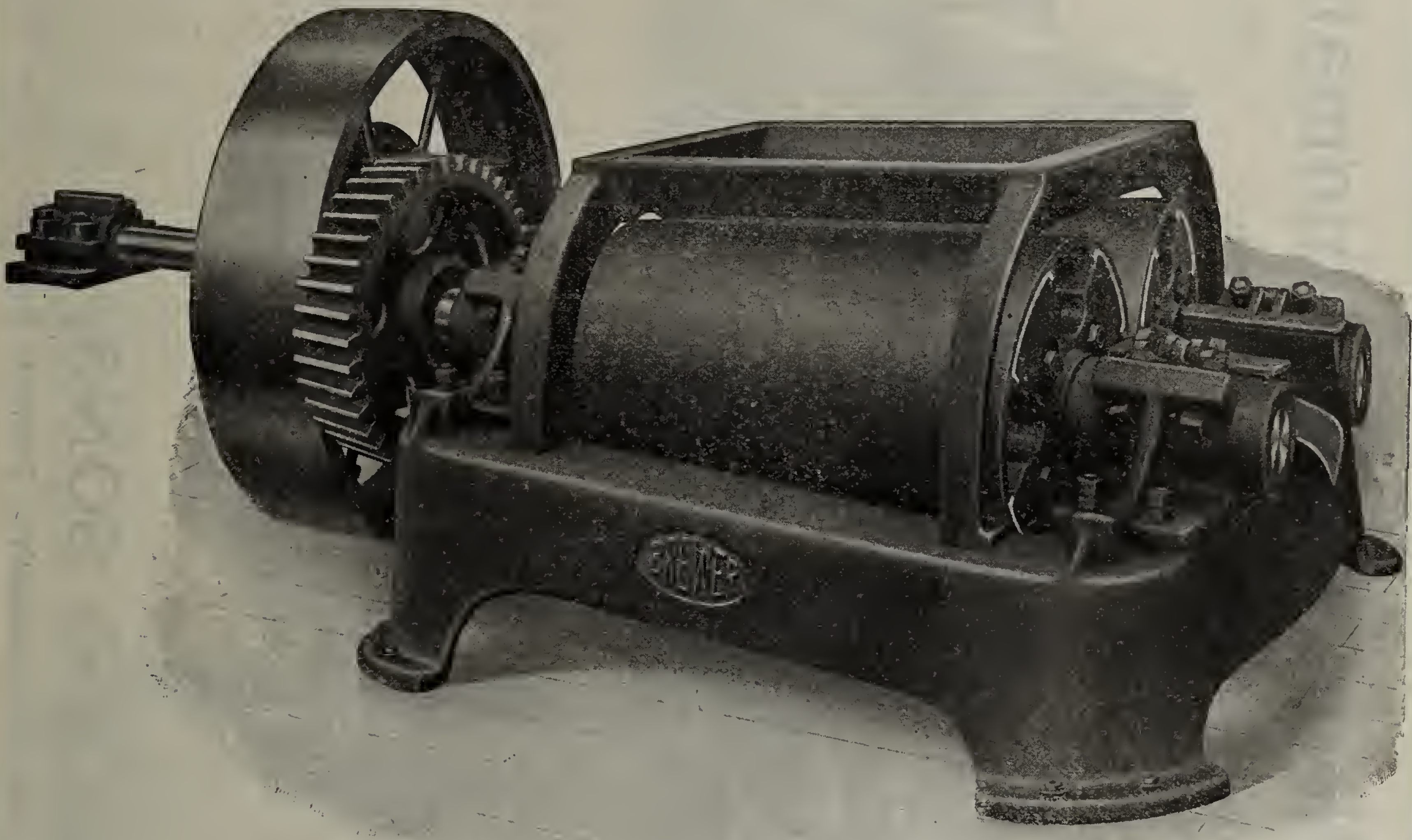
The price is $2.00.

T. A. Randall & Co.
Publishers
Indianapolis, Ind.

IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD IF MARKED BREWER IT'S GOOD

CLAY CRUSHERS

We make a specialty of Crushers. We build all kinds and sizes—Conical, Straight, and Beaded Roll Crushers, Compound Crushers, Disintegrators and Dry Pans.
We make the rolls with removable shells and we make the shells of a special hard and durable material, which compared on a basis of cost, outwears manganese steel or anything else.



But Crushers are only a small part of our line—we also build

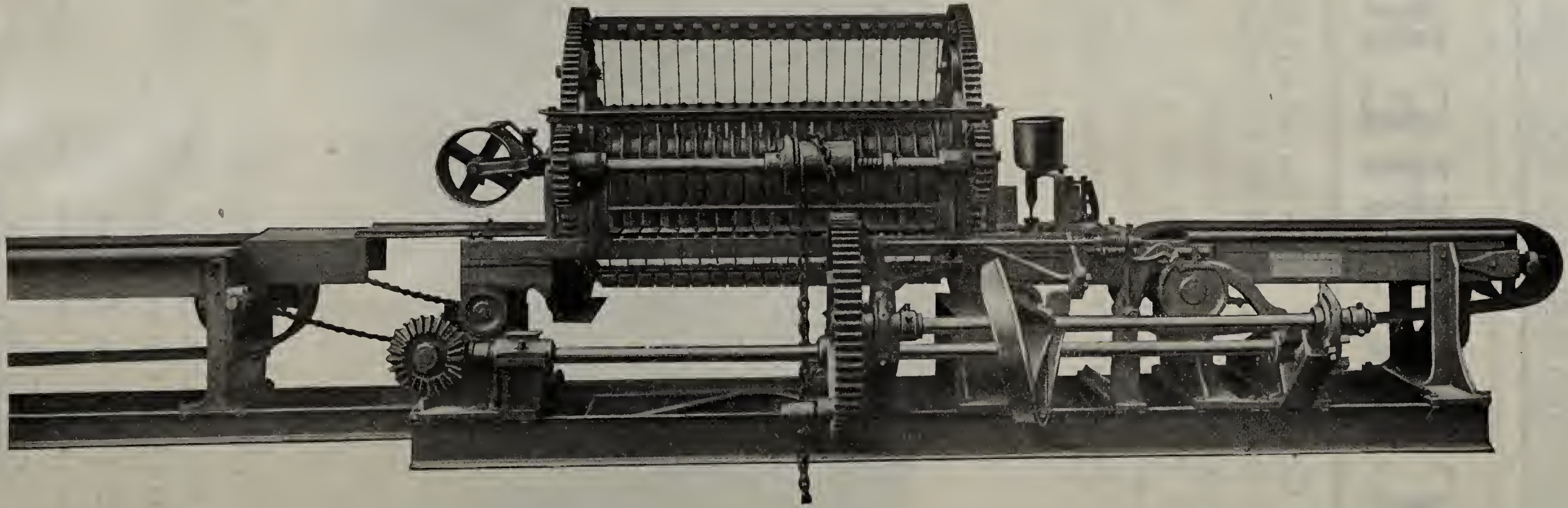
Brick Machines, Drain Tile Machines, Automatic Cutters, Pug Mills, Granulators, Hoists, Conveyors, Etc.

GET OUR COMPLETE CATALOG.

H. BREWER & CO. BREWER **Tecumseh, Mich.**

Steele's New No. 18 Automatic Side Cutter

Capacity 15,000 brick per hour. Weight 6,000 lbs.



The power is applied to the reel so as to offer no resistance to the carriage. In fact, it helps start it moving.

The reel is driven by crank motion, which gradually starts and stops it, eliminating shocks and jars.

The back platens are fitted with spring jaws, to prevent breakage of wires.

The best wire suspension known, making possible effective wire cleaners.

This cutter solves a hard problem in the most effective way yet attained, especially in very large capacities.

Investigate.

J. C. STEELE & SONS, Statesville, N. C.

Western Representative: George H. Smith, 510 Reliance Bldg., Kansas City, Mo.

**HERE IS
A
KILN
THAT WILL
DO AWAY
WITH
YOUR
KILN LOSSES**

The control of the fires in a kiln is the all important feature which governs the losses in the making of the finished product. The elements entering into the control of the fires are the ease by which it is done, the supplying of fuel to the place mostly in need of it, and the ability to rapidly change this amount.

These elements are found in the highest state of perfection in the Producer Gas Fired Continuous Kiln.

The control is by means of valves. The operator regulates his fires with ease, while watching them through the peep hole, and it is a well known trait of human nature that the easiest work will be the best done.

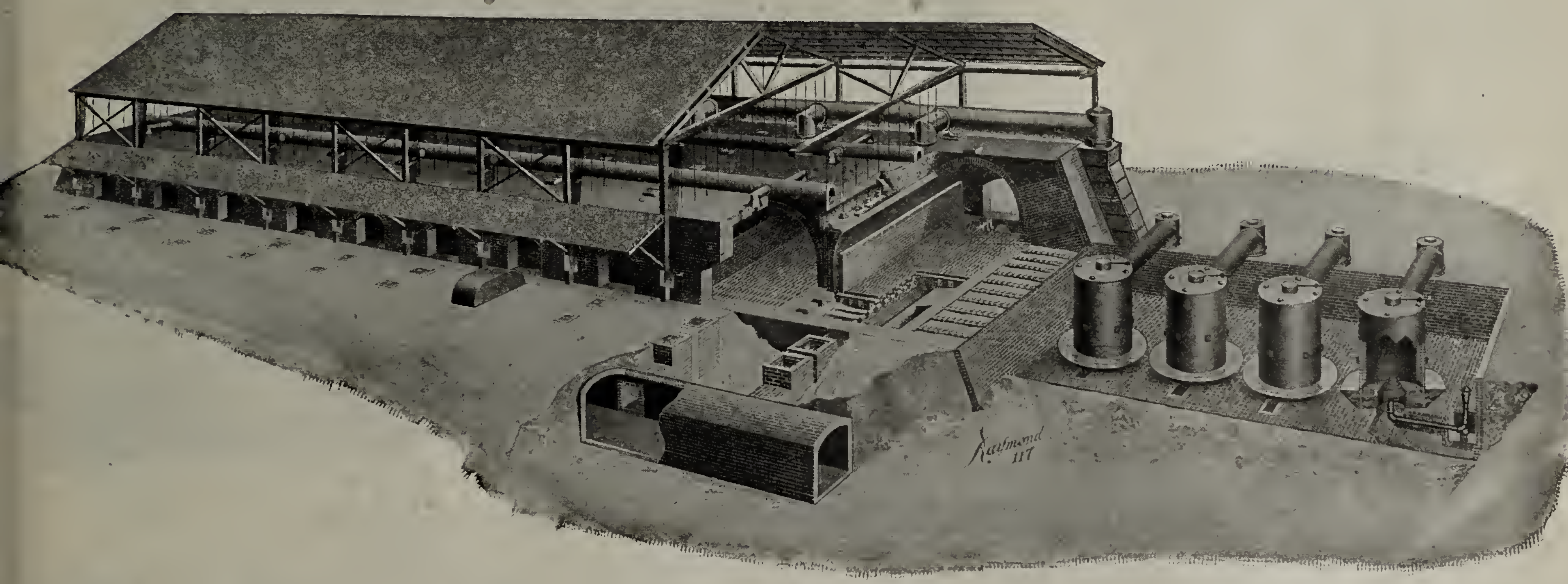
That gas is readily transported to any convenient place is a fact too well known to need discussion. So any amount can be obtained and maintained where wanted. It is this which gives the flexibility of control which is so greatly to be desired.

In case the operator's inspection shows the chamber to be too high or too low in temperature, he can make an almost instantaneous change by the manipulation of the valves.

A loss of one-half of one per cent or less, with a fuel saving of 60% sounds interesting, doesn't it? Better write now while you think of it.

International Clay Machinery Co.

Dayton, Ohio, U. S. A.



The Producer Gas Fired Continuous Kiln

HERE ARE SIX GOOD REASONS WHY YOU, TOO, SHOULD USE A FREESE CUTTER

The operating principle is so extremely simple that it can be immediately thoroughly understood by your cutter man—

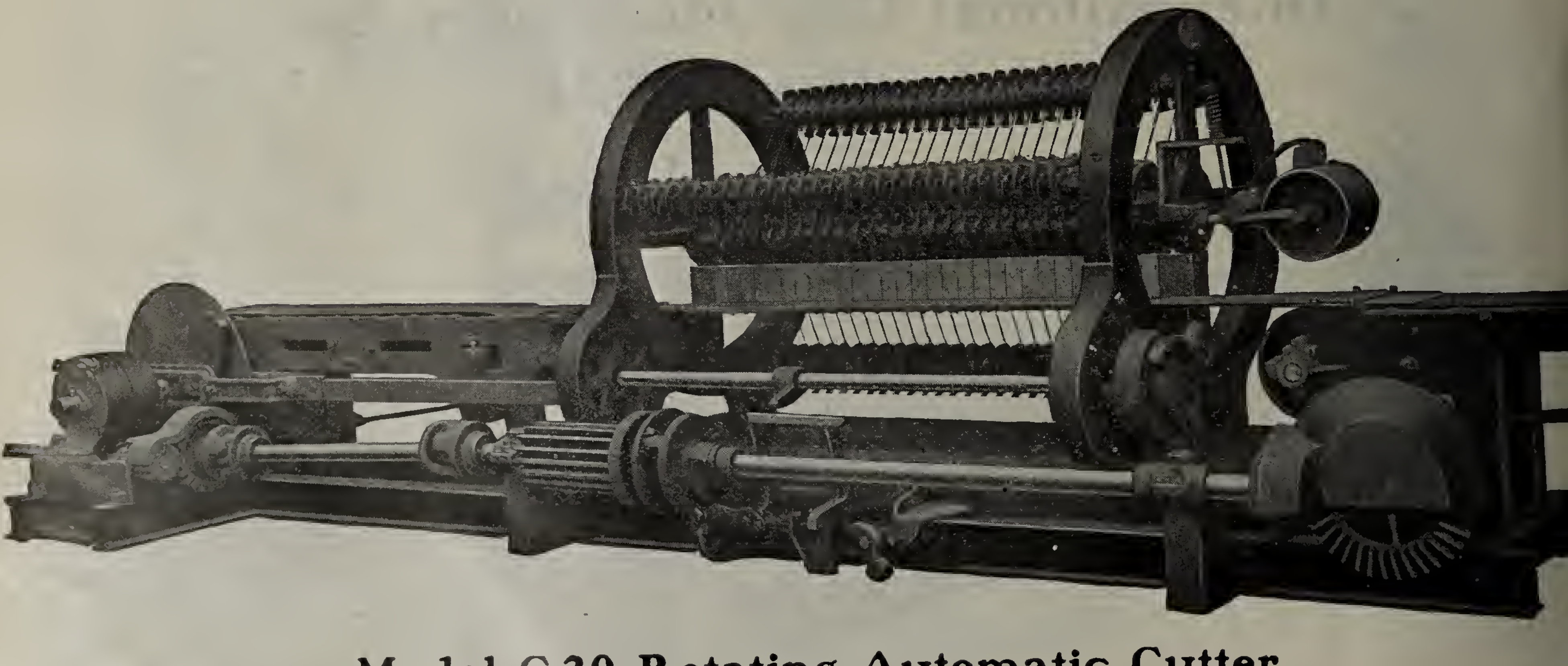
As the operating mechanism is **positive,** there is no inclination to miss a cut, and for the same reason the cutter requires practically no attention in operation—

There are so few wearing parts that the cost of maintenance is unusually small—

It is a durable long-life cutter—Some of the first Freese Cutters built are still in operation—

It is producing the highest grade un-repressed face brick on the market today.—There can be no question as to the quality of product it will produce—

It is in operation in several hundred plants, working in many kinds of clay, under different working conditions.—You can feel reasonably certain that it will operate successfully in your material and under your conditions.



Model C 30 Rotating Automatic Cutter

E. M. FREESE & COMPANY, 140 South St., Galion, Ohio

Dependable Machinery of Proven Efficiency

For Sixty-Three Years The Name

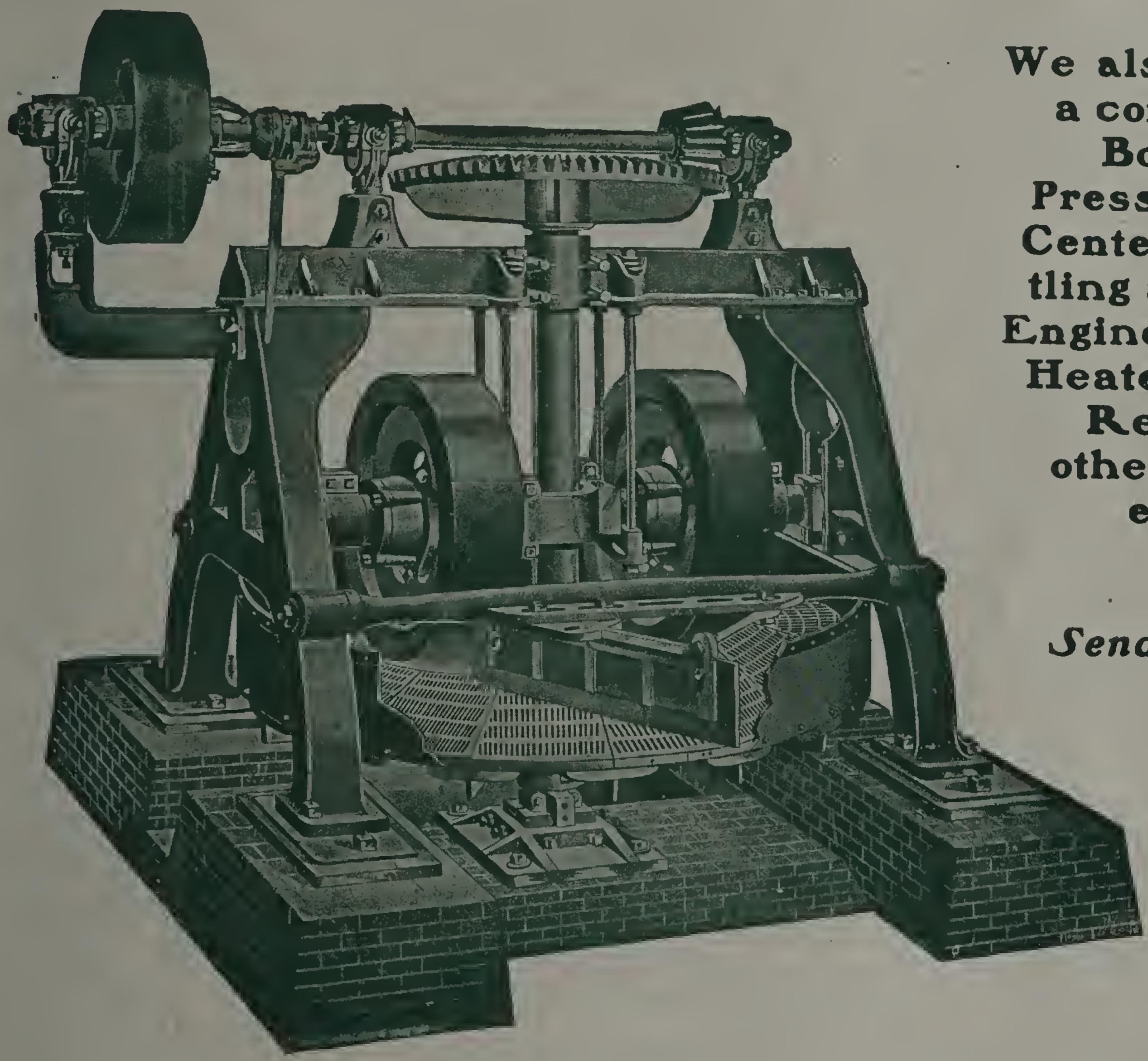
Frost

Has stood for all that is best in Power Plant Equipment, Crushing and Mixing Machinery

ESTABLISHED 1851

There are *more* Frost Dry and Wet Pans being operated successfully in all parts of the World than any other similar machine.

WHY! Because their capacity is greater and the cost of upkeep, due to natural wear, is less. They ALWAYS give satisfaction. Write us for descriptive matter.



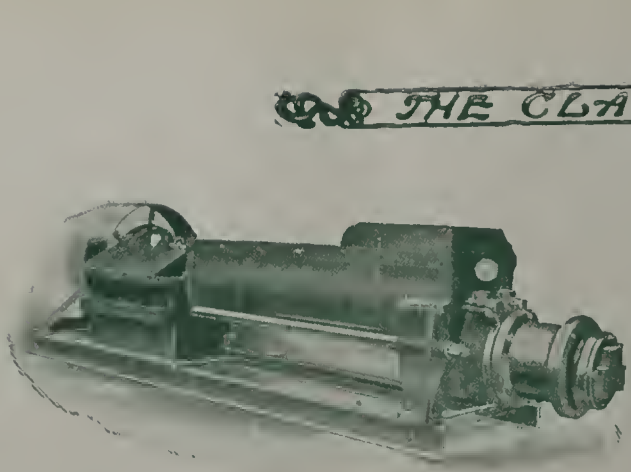
We also manufacture a complete line of Boilers for all Pressures, Side and Center Crank Throttling and Automatic Engines, Feed Water Heaters, Tanks, Air Receivers and other power plant equipment.

Send for Bulletins.

The Frost Manufacturing Co.

Works at
GALESBURG, ILL.

Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.



The Wise Man of FATE

The Fate Special Premier Machine

Will Enable YOU to Make Perfect Hollow Ware and Accomplish This at a Living Profit

Failure to make a merchantable hollow ware may be attributed to the machine as often as to the clay or to the man that manipulates the clay.

Makeshift machinery won't do it. Hollow ware machines must be HOLLOW ware machines, and this is WHY the Fate Special Premier Hollow Ware Machine is making a profitable product out of a clay that is declared to be difficult to handle.

"The Fate Special Premier"

Will Make Hollow Ware at a Living Profit, Because:

It has the proper mixing chamber with the specially designed knives to give just the right mixture to the clay—absolutely necessary to the manufacture of salable hollow ware.

It has the proper "force" to the clay to enable it to fill out all the mold and deliver to the off-bearing belt a perfectly made ware.

It has the properly designed dies.

It has stability.

It has durability.

It has the maximum of productiveness at the minimum of cost.

The Clay Products Co., Brazil, Ind.

Proves This Statement to be TRUE!

This concern, one of the largest and most successful clay product plants in the United States, is making hollow ware with a "Fate Special Premier Hollow Ware Machine."

Two of these big "Premier" are used on making conduit ware—one of the most difficult of wares to manufacture, because of the exacting conditions.

Not only must this ware be symmetrical, both inside and out, but the ends of the ducts must be perpendicular to sides. Then, too, there must be no projections or defects which will weaken the conduits, or which will prove an obstacle in pulling cables through the ducts. All duct holes must be well centered and all duct walls must be of a specific thickness.

The multiple ducts must have dowell pinholes for perfect alignment so that each hole will fit perfectly and be interchangeable in all parts.

No other machine will give such a uniform ware as the "Fate Special Premier" and, at the same time permit a living profit, and the Clay Product Company has proven this to their own satisfaction.

You Can Do the Same

If the "Fate Special Premier" will make conduit ware successfully it certainly can make any hollow ware at a profit.

We have a special bulletin on hollow ware machinery—why not send for it and investigate a little?

The J. D. Fate Co., 242 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

☐ Auger Brick Machinery.
☐ Hollow Ware Machinery.
☐ Conveyors.
☐ Crushers.
☐ Elevators.
☐ Clay Feeders.
☐ Disintegrators.
☐ Pug Mills.
☐ Clay Testing.
☐ Full Equipment.
☐ Industrial Locomotives.
☐ Drain Tile Machinery.

Name ....

Town.................................. State..........

We Make Everything for the Clayworker

"The House of Fate" manufactures everything a clayworker uses—and every machine or device is designed for its special purpose just as are "Fate Special Premier Hollow Ware Machines."

There are no makeshifts in Fate machinery—no patched up machines "to answer a purpose."

Let Fate's Free Service Help You

Our Engineering Department is at your service and FREE in any of the problems that confront you.

Give us a frank statement of your needs or requirements and let us make you a proposal. You do not have to buy or agree to buy anything.

Use the Coupon

At the right there is a coupon. Check off the items you are interested in and stick this coupon to your letter head, or to a slip of paper, and mail it today.

The J. D. Fate Co.

242 Riggs Ave. Plymouth, Ohio

The Wise Man of FATE

"The Plymouth"

Will Do YOUR Haulage Cheaper and Better than Man, Horse, Compressed Air, Steam, Electric or ANY OTHER Gasoline Locomotive.

This statement is not an idle one. It is made as a positive statement of FACT and broad as it may SEEM to you, we give you the assurance that it is backed up by the PROOF of "Plymouth" users and that we are going to convince you by showing you this proof.

"The Plymouth"

Will Do Your Haulage Cheaper and Better, Because---

It Uses Gasoline—the most economical of ALL Fuels.

It uses the "Plymouth" Friction Drive, which gives MORE power, per unit of energy, a greater FLEXIBILITY of operation, a LIMITLESS number of speeds—the same forward, the same backward, a quicker PICK-UP of loads, and a greater freedom from JERKS and STRAINS, than does ANY OTHER system of transmission.

It uses a HEAVIER frame, which gives it greater TRACTION power and enables it to PULL MORE per horse power, and to take greater and higher GRADES, than any other locomotive of the SAME horse power.

Frank Fleigle, Morrisonville, Illinois, Says This Statement is TRUE!

This is Mr. Fleigle's 8-year-old son, who operates "The Plymouth."

Mr. Fleigle has had a "Plymouth" in actual use about 18 months, the locomotive replacing dump cars drawn by horses, and because of the short haul he has (300 feet) and the 10 per cent grade he has to negotiate, we select his case as a fair one for evidence.

Certainly, if "The Plymouth" can be of a profit to a small plant like that operated by Mr. Fleigle, it ought to be profitable to a larger plant. Read what he says:

"We find that the 'Plymouth' is costing us for fuel about HALF to feed the two horses we formerly had.

"At one time we used a drum hoist with electric motor, but this required a man with a horse to set the empty car in the pit, and we have proven that the 'Plymouth' not only is cheaper than the horse and dump cars, but also cheaper than the hoist.

"My 8-year-old son runs the 'Plymouth,' easily starting and stopping without trouble, even on a 10 per cent grade. Our repair bills for the past 18 months have been less than $1. Our candid opinion of the 'Plymouth' as a load-pulling locomotive is that it cannot be beaten."

The J. D. Fate Co., 242 Riggs Ave.
Plymouth, Ohio

We Have a Big Book of "Plymouth Facts"

You ought to learn all about the "Plymouth" because it may open your way to a real profit in your business.

We have a book which tells all about the "Plymouth," and also by illustration and letters from users shows just what it is doing for other clayworkers.

Get ALL the Truth

Send for this book—a copy to you for the asking, and then act as judge. It is full of FACTS—and it is FREE.

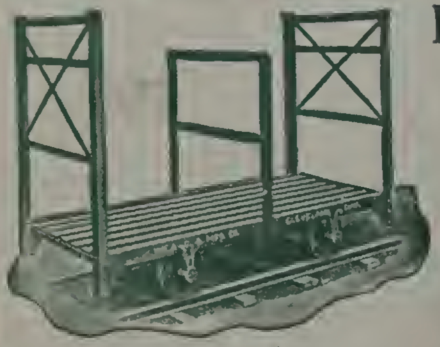
Send Coupon

At the right there is a coupon—it is placed there for YOUR convenience. Sign it, place it in a letter and mail it TODAY, or, if you wish, write us a letter and state just what your haulage conditions are and we will send not only the FREE book, but also make you a proposal.

The J. D. Fate Company
242 Riggs Ave.
Plymouth, Ohio

Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

Firm Name (Firms) ....
(Signed by) ....
(City) ....
(Street) ....
(State) ....



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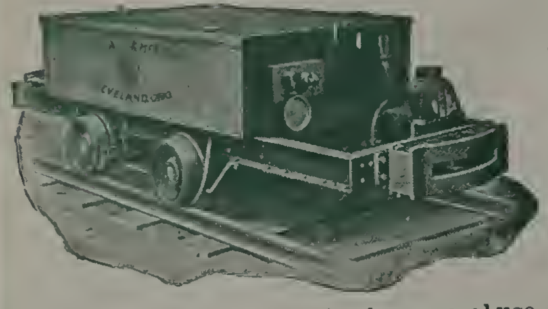

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